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Public Health Reports

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PREVALENCE OF POLIOMYELITIS IN THE UNITED STATES IN 1938

By C. C. DAUER, M. D., *Epidemiologist, District of Columbia Health Department*

In a report on poliomyelitis in the United States which appeared in the Public Health Reports in 1938,[1] the incidence of the disease by States from 1915 to 1937, inclusive, was presented, and its occurrence by counties for the 5-year period from 1933 to 1937 was shown. The present report will show the prevalence of the disease in 1938 by States and counties, using data from the same source as that of the previous paper. No data on the number of deaths by States in 1938 are available as this report is written.

TABLE 1.—*Number of cases of poliomyelitis, case rates, deaths, and death rates in the United States from 1915 to 1938*

Year	Number of cases reported [1]	Number of States reporting	Case rate per 100,000 population	Number of deaths registered [2]	Number of States in registration area	Death rate per 100,000 population
1938	[3] 1,712	48	1.3			
1937	9,511	48	7.4	1,433	48	1.1
1936	4,523	48	3.5	780	48	.6
1935	10,839	48	8.5	1,040	48	.8
1934	7,519	48	5.9	852	48	.7
1933	4,983	45	4.3	797	48	.6
1932	3,778	44	3.2	828	47	.7
1931	15,790	43	14.6	2,096	47	1.8
1930	9,188	45	7.9	1,370	47	1.2
1929	2,837	41	2.7	812	46	.7
1928	5,113	45	4.6	1,381	44	1.2
1927	10,533	48	8.9	2,013	41	1.9
1926	2,528	42	2.5	851	41	.8
1925	5,926	44	5.6	1,492	40	1.5
1924	5,199	38	5.7	1,079	39	1.1
1923	3,266	40	3.4	850	38	.9
1922	2,222	39	2.4	790	37	.8
1921	6,266	42	6.9	1,597	34	1.8
1920	2,325	36	2.8	769	34	.9
1919	1,932	32	2.4	747	33	.9
1918	2,493	34	2.9	960	30	1.2
1917	4,082	30	5.4	1,182	29	1.4
1916	27,363	27	41.4	7,130	26	10.6
1915	1,634	22	3.1	691	25	1.1

[1] Hampton, B. C.: Poliomyelitis: Prevalence since 1915 and during first half of 1938. Pub. Health Rep., 53:1143 (1938).
[2] Mortality statistics reports, Bureau of the Census.
[3] Total number of cases for 1938, provisional.

The incidence of poliomyelitis in the United States in 1938 was at a fairly low endemic level in all sections of the country. The total number of cases reported was smaller than in any year since the epidemic in 1916. (See table 1.) Although fewer cases were reported

[1] Dauer, C. C.: Studies on the epidemiology of poliomyelitis. Pub. Health Rep., 53: 1003-1020 (1938).

in 1915, the number of States reporting in that year was less than half the number in 1938. In 1915 the population of the 22 States reporting was approximately 53 millions, while in 1938 the estimated population of the United States was approximately 130 millions.

TABLE 2.—*Poliomyelitis case rates and death rates per 100,000 population by States, 1933–38*

Division and State	Case rates						Death rates				
	1933	1934	1935	1936	1937	1938	1933	1934	1935	1936	1937
United States	4.3	5.9	8.6	3.5	7.3	1.3	0.6	0.7	0.8	0.6	1.1
New England States:											
Maine	8.1	2.7	19.0	5.0	16.1	1.7	.8	.6	1.7	.4	2.0
New Hampshire	2.8	.8	9.5	.8	4.9	.2	1.2	0	2.2	.2	0.2
Vermont	13.7	1.6	17.7	2.1	7.6	2.3	1.3	0	1.9	0	1.0
Massachusetts	8.2	1.7	32.0	1.3	7.9	.4	.7	.3	1.4	.3	.5
Rhode Island	3.0	.1	51.5	.7	3.2	.9	.1	0	3.4	.1	.1
Connecticut	4.8	.8	23.4	.9	6.2	1.2	.2	.2	1.5	.4	.7
Middle Atlantic States:											
New York	3.2	1.7	22.2	1.5	4.9	1.1	1.1	.3	1.1	.2	.4
New Jersey	5.5	1.4	11.8	.6	3.6	.9	.5	.3	.8	.2	.5
Pennsylvania	4.1	1.4	2.2	1.3	3.3	.8	.5	.3	.3	.2	.5
East North Central States:											
Ohio	5.3	4.3	1.3	5.1	7.9	.8	.8	.5	.5	.8	1.0
Indiana	1.3	1.9	1.4	1.5	4.2	.4	.2	.6	.3	.5	.9
Illinois	2.6	4.8	3.0	8.8	9.9	1.4	.3	.3	.5	1.0	1.2
Michigan	1.9	4.9	13.0	3.2	9.0	1.2	.1	.6	.9	.5	1.2
Wisconsin	2.2	4.7	2.2	1.5	11.4	1.7	.5	.6	.2	.2	1.3
West North Central States:											
Minnesota	14.4	4.0	3.6	1.2	12.6	1.6	1.5	.8	.5	.2	1.9
Iowa	1.7	1.5	2.5	3.0	9.4	1.5	.6	.4	.3	.5	1.6
Missouri	1.0	.9	1.3	2.7	9.9	.6	.4	.4	.4	.6	1.9
North Dakota	11.8	1.4	1.7	2.7	.9	1.1	1.3	.6	.4	.4	1.3
South Dakota	5.3	6.3	2.1	1.9	5.7	4.0	.6	1.4	.9	.1	1.0
Nebraska	1.9	1.5	.9	1.7	16.0	.7	.4	.6	.8	.8	3.4
Kansas	2.9	4.3	1.9	5.0	12.9	.6	.6	.6	.5	.5	1.8
South Atlantic States:											
Delaware	2.8	1.2	2.0	.4	3.1	.8	.4	0	.4	.4	.4
Maryland	2.6	1.5	6.4	2.2	4.8	1.0	.2	.4	.3	.2	1.0
District of Columbia	2.2	2.0	14.3	1.1	4.8	4.3	.4	.5	1.9	.3	.6
Virginia	1.5	3.0	25.7	2.2	2.4	2.0	.4	.7	1.9	.5	.5
West Virginia	5.2	4.7	2.2	3.4	3.7	.8	1.1	1.1	.7	1.1	1.1
North Carolina	.9	1.4	19.8	1.5	3.1	1.4	.5	.5	2.1	.5	.8
South Carolina	1.6	1.9	2.1	1.2	1.2	1.4	.8	.4	.7	.9	.7
Georgia	1.4	.8	.8	4.8	2.7	1.9	.3	1.0	.6	1.1	.8
Florida	.5	1.0	1.0	2.5	1.8	1.8	.4	.2	.4	.4	.3
East South Central States:											
Kentucky	1.6	4.2	11.5	3.1	4.4	1.3	1.0	1.4	1.6	1.2	1.0
Tennessee	4.3	2.2	3.2	13.2	4.4	1.1	1.2	1.2	1.0	1.5	1.0
Alabama	1.0	1.8	2.1	14.6	2.9	3.4	.4	.5	.5	1.5	.6
Mississippi	.7	1.7	.8	9.5	21.0	3.4	.5	1.0	.5	1.0	2.9
West South Central States:											
Arkansas	.4	.4	.8	2.7	16.2	1.6	.6	.3	.4	.9	4.2
Louisiana	1.4	1.2	4.8	1.6	6.2	2.0	.5	.2	.6	.4	.9
Oklahoma	1.2	.6	.5	5.0	18.1	1.1	1.1	.8	.4	1.4	2.8
Texas	.8	2.5	1.3	1.1	10.7	1.0	.8	1.2	.8	.6	2.0
Mountain States:											
Montana	2.4	60.3	1.1	2.6	5.8	2.6	.4	2.6	.2	.9	1.1
Idaho	1.8	33.0	.9	4.3	3.9	2.4	.9	3.0	.6	1.2	1.0
Wyoming	4.8	3.5	.9	3.0	16.7	.4	0	.9	.9	.4	2.6
Colorado	.6	1.9	2.1	6.3	19.4	1.3	.4	.4	1.1	1.4	3.7
New Mexico	2.1	4.2	2.4	7.4	6.1	2.6	.2	1.4	.9	1.7	1.7
Arizona	7.5	32.0	6.1	3.4	6.8	2.2	1.0	4.2	2.0	1.2	1.0
Utah	4.4	2.9	2.1	1.3	6.4	.8	1.0	.6	.2	.2	1.7
Nevada	2.1	16.3	2.0	2.0	5.0	0	1.0	1.0	0	0	1.0
Pacific States:											
Washington	5.6	45.8	2.4	4.7	5.3	1.1	1.0	3.3	.4	1.0	.5
Oregon	3.6	8.1	4.6	3.6	6.0	1.5	1.0	.8	1.6	.9	.7
California	2.9	56.6	13.7	6.4	11.5	2.2	.2	1.8	1.1	.6	1.3

A study of the incidence of poliomyelitis by States in 1938 (see table 2) reveals the fact that the incidence of the disease was fairly low and fairly evenly spread throughout the entire country. In contrast with the preceding 5 years, there were no States showing a

high prevalence. One State, Nevada, reported no cases, and New Hampshire and Wyoming reported but one case each. The highest rates of incidence were recorded in the District of Columbia (4.3 per 100,000) and in South Dakota (4.0). If nonresident cases are excluded from the District of Columbia cases the rate becomes 3.2 per 100,000 population. Alabama and Mississippi also had relatively high rates for 1938, namely, 3.4 in each State, which was two and one-half times the rate for the entire United States. Montana, Idaho, New Mexico, and Arizona also experienced somewhat higher rates than for the country as a whole. However, the incidence in the various States just enumerated is exceedingly low when compared with the maximum found in previous years.

The accompanying map (figure 1) shows the incidence of poliomyelitis by counties for 1938. With the exception of a small group of counties in South Dakota and other scattered counties in the Northwestern part of the country and several isolated counties in other sections the rate of incidence was uniformly low. There were no large groups of counties with relatively high rates such as occurred in the preceding 5 years. The number of counties not reporting any cases was quite large in 1938 as compared with the number in the years from 1933 to 1937.

In spite of the low incidence generally, it was found that 57 counties reported cases of poliomyelitis in 1938 in which no cases had been recorded in the 5-year period immediately preceding. A total of 89 cases was reported from these 57 counties, or about 5 percent of the total (1,712). These counties constituted five-tenths of 1 percent of the total population of the country. The case rate for this group was 12.5 per 100,000 population, nearly 10 times that for the entire United States. The median rate was 11.1 and the median population was 11,570 in this group. The majority of the counties were located in the South Atlantic, West North Central, and West South Central States.

Only 16 counties out of the total of 3,044 counties had case rates in excess of 30 per 100,000 population in 1938. Of these, 8 had not reported cases during the preceding 5 years. The number of persons residing in 11 of the 16 counties with rates of 30 or more, was less than 5,000 each; consequently 1 or 2 cases, as was the case in 10 counties, resulted in high rates which cannot be regarded as significant. In 1 of the 6 remaining counties, viz, Kern County, Calif., a comparatively high rate was recorded for the fifth consecutive year. The explanation for this continued high rate appears to lie in the fact that many "abortive" cases are reported each year, even though the disease is not epidemic in other counties in the same part of the State.

One county in Wisconsin experienced a fairly severe epidemic of poliomyelitis, an account of which seems worth reporting. Bayfield

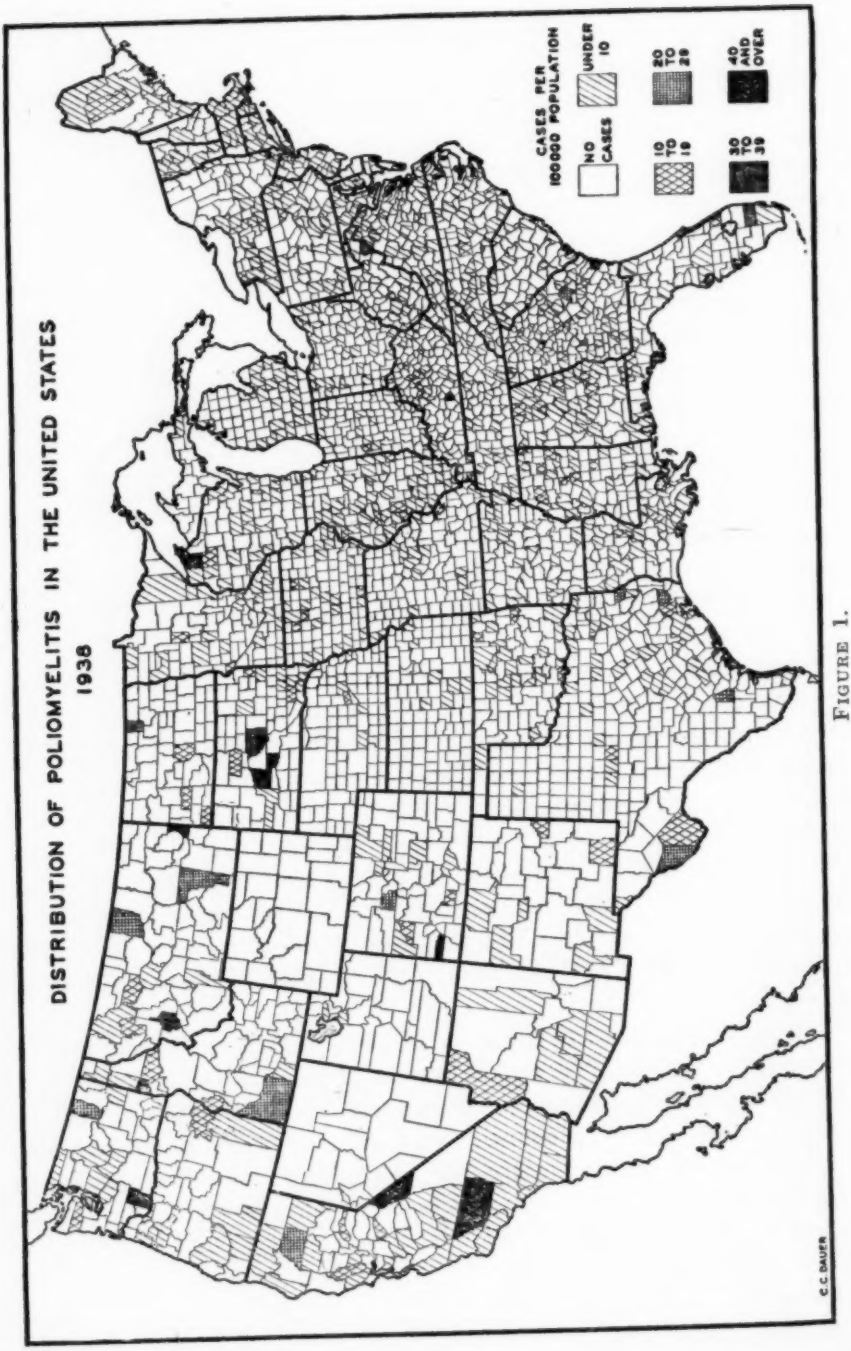

DISTRIBUTION OF POLIOMYELITIS IN THE UNITED STATES
1938
CASES PER 100000 POPULATION
NO CASES
UNDER 10
10 TO 19
20 TO 29
30 TO 39
40 AND OVER
C.C. DAUER

FIGURE 1.

County has a population of about 16,000, 11,000 of which is in the city of Ashland. No cases had been reported in the 5 years immediately preceding 1938. According to a statement contained in a personal communication from the district health officer to the author, 13 cases were recognized during the months of August and September. During the early part of August, 3 cases occurred in 1 family living on a farm in the northeastern section of the county. The date of onset of the first case was given as August 2, and August 4 for the other two. A neighbor boy, in the only nearby family, had a similar illness, with the onset on August 5. These 4 cases had typical paralysis. Subsequently, 2 cases developed in a village about 10 miles south of the farm where the first cases occurred, and 7 scattered cases within a few miles north of the original group. Two of the 7 were in Indian children. No connection could be traced between cases except for the 4 original cases, which appear to have had a common source of infection. All were in children with typical and comparatively mild symptoms, though several had marked residual paralysis. There were no deaths. The city of Ashland, about 10 miles distant from the nearest case in Bayfield County, is frequented by people from the region about for commercial and social purposes. However, no cases were recognized in Ashland, although physicians were warned of the presence of poliomyelitis in the county.

Hughes County, S. Dak., reported 5 cases in 1938, which gave it a rate of 70 per 100,000 population. The State board of health reports that all 5 cases were under the care of one physician. Three cases were of the abortive type, and all 5 had consistently low spinal fluid cell counts. The cases were widely scattered and apparently there was no connection between any of them.

The following information was received concerning an exceedingly interesting group of cases of poliomyelitis occurring in Niagara Falls, N. Y. Twenty cases of recognized poliomyelitis occurred in the city of Niagara Falls from July 23 to September 20, 1938. In 13 of the 20 cases, definite bulbar paralysis was observed, and 12 of these cases terminated fatally. There was a definite geographical grouping of cases in the city. Ten of the cases occurred within a radius of three city blocks, and all but 2 occurred in persons residing within 10 blocks of the Niagara River. However, this did not constitute a definite concentration of cases near the waterfront, because the population of the city is distributed about two arms of the Niagara River and no point in the city is more than 15 or 20 blocks from the river. No history of direct contact between cases was obtained, but in a number of instances friends in common were found. No multiple cases occurred in households, nor were there any suspicious illnesses among contacts.

During the year 1938 there were no outstanding advancements in the epidemiology of poliomyelitis. Progress in this field appears to depend upon finding more suitable or susceptible animals for experimental investigations than those available at the present time. Discovery of a more susceptible animal than the monkey, and one which would be available in sufficient numbers and at a comparatively low cost, would be a great aid in solving a number of epidemiological problems.

Mr. H. G. Eubank of the Division of Sanitary Reports and Statistics of the Public Health Service, supplied most of the data used in the preparation of this paper from reports of the various States to the Public Health Service, for which acknowledgment is gladly made. Dr. John W. Lowe, district health officer, Ashland, Wis., and Dr. R. H. Wilcox, epidemiologist, South Dakota State Board of Health, supplied information regarding the groups of cases occurring in their respective States which are described in this paper. Dr. E. L. Stebbins, assistant commissioner, New York State Department of Health, very graciously furnished information concerning the group of cases in the city of Niagara Falls, N. Y. A detailed report on this group by Dr. Stebbins will appear in the Journal of the American Medical Association.

DOMESTIC WATER AND DENTAL CARIES, INCLUDING CERTAIN EPIDEMIOLOGICAL ASPECTS OF ORAL *L. ACIDOPHILUS*[1]

By H. Trendley Dean, *Dental Surgeon*, Philip Jay, *Consultant*,[2] Francis A. Arnold, Jr., *Assistant Dental Surgeon*, Frank J. McClure, *Associate Pharmacologist*, and Elias Elvove, *Senior Chemist, United States Public Health Service*

INTRODUCTION

A recent report (*1*) has pointed out an inverse relationship between endemic dental fluorosis and dental caries. An increased freedom from dental caries was demonstrable in school children with verified continuity of exposure to domestic waters the fluoride content of which measured 1.7 to 2.5 parts per million, when compared with children of similar ages living in areas where the domestic water supply contained relatively low amounts of fluorides (0.6 to 1.5 p. p. m. F). These observations permitted the formulation of the hypothesis that the factor or factors responsible for partially inhibiting the development of dental caries was present in the domestic water supply and, also, was operative whether or not the tooth showed macroscopic evidence of mottled enamel. Further support was given to

[1] From the Division of Infectious Diseases with the cooperation of the Division of Chemistry, National Institute of Health.

[2] Associate professor, University of Michigan School of Dentistry.

this hypothesis by a study of the data on dental caries reported in Public Health Bulletin No. 226 (*2*), the analysis disclosing a lower amount of dental caries in mottled enamel areas than in nonendemic areas in the same State.

To test further the hypothesis a detailed survey of four Illinois cities was planned: Galesburg and Monmouth, where the communal water supplies contain 1.8 and 1.7 parts per million of fluorides, respectively, and the nearby cities of Macomb and Quincy, where the common water supplies are relatively free from fluorides (0.2 p. p. m. F). At Galesburg and Quincy stimulated saliva samples were collected from approximately 200 children in each city and a quantitative estimation of the *L. acidophilus* was made. Saliva samples from 145 children of these two groups were forwarded to the National Institute of Health for a determination of the amylolytic activity. The purpose of the survey was to study the possible relationship of the domestic water supply to the amount of dental caries in each community.

It is well known that factors such as age, sex, and color influence the amount of dental caries in a given group of children. The extensive experimental work in the field of nutrition, including controlled human experiments, points to diet as a factor of major importance, especially in its relation to a high or low carbohydrate intake. Among other factors, latitude and intensity of sunlight have been suggested. In the planning of this survey an attempt was made to take account of these factors insofar as possible. The plan was, briefly, to limit all clinical examinations to 12-, 13-, and 14-year-old white children with continuity of risk of exposure to the variable being studied. It was thought that the magnitude of the sample at Galesburg and Quincy and the inclusion of practically all children possessing the requisites of continuous exposure at Monmouth and Macomb would largely equalize dietetic variations within the groups. The proximity of the cities themselves, located as they are in the flat prairie country of the western part of north central Illinois, should largely eliminate differences in sunlight intensity. Specific discussion of these factors and the methods adopted in an attempt to equalize them within the limits of a survey of this nature will appear later in the text.

Before describing further the methods used in the study and the findings, it seems desirable to record certain basic information, including population and climatological data, and a description of the physical set-up of the four water supplies concerned.

Population of cities studied.—Population statistics for the 4 cities studied are given in table 1. Briefly, the population of Galesburg, Monmouth, Macomb, and Quincy in 1930 was approximately 88, 91, 97, and 93 percent, respectively, native white.

TABLE 1.—*Stability and composition of population of 4 Illinois cities (Galesburg, Monmouth, Macomb, and Quincy), according to the census of 1930*

[15th Census of the United States, 1930, Population, vol. 3, pt. 1, Bureau of the Census]

	Galesburg	Monmouth	Macomb	Quincy
	POPULATION			
1910	22,089	9,128	5,774	36,587
1920	23,834	8,116	6,714	35,978
1930	28,830	8,666	8,509	39,241
	COMPOSITION OF NATIVE WHITE POPULATION, 1930			
Total	25,458	7,862	8,267	36,601
Native parentage	19,556	6,647	7,604	27,910
Foreign or mixed parentage	5,902	1,215	663	8,691
Foreign-born white	2,213	366	122	1,461
	NATIVE WHITE OF FOREIGN OR MIXED PARENTAGE BY COUNTRY OF BIRTH OF PARENTS [1]			
Total	5,902	1,215	663	8,691
England	489	(2)	(2)	306
Irish Free State	707	(2)	(2)	524
Sweden	2,850	(2)	(2)	(3)
Germany	701	(2)	(2)	6,882

[1] Countries represented by less than 200 are omitted.
[2] Not given in census statistics for cities under 10,000 population.
[3] Less than 200.

Extrinsic factors (hardness of the domestic water, latitude, and intensity of sunlight).—Mills (*3*) states that dental caries shows certain definite relationships to extrinsic factors such as, for example, latitude, sunlight intensity, and hardness of the drinking water. The reports of Förberg (*4*) in Sweden, Röse (*5*) in Germany, Cook (*6*) in England, and Mills (*3*) with respect to the United States, indicate that an increased hardness of the drinking water is associated with a lower

TABLE 2.—*A 5-year summary of available data concerning number of clear, partly cloudy, and cloudy days recorded for the 4 cities studied, and the elevation of each*

[From Weather Bureau, Department of Agriculture]

	Elevation (feet)	Number of days														
		Clear					Partly cloudy					Cloudy				
		1937	1936	1935	1934	1933	1937	1936	1935	1934	1933	1937	1936	1935	1934	1933
Galesburg	758	189	223	(1)	178	(1)	60	50	(1)	73	(1)	116	93	(1)	114	(1)
Monmouth	763	137	168	119	150	160	93	95	96	106	96	135	103	150	109	109
Macomb	702	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Quincy	488	174	207	143	185	155	72	67	69	64	73	119	92	153	116	137
State average		158	183	138	169	162	92	87	86	92	91	115	96	141	104	112

[1] Not recorded.

amount of dental caries. The limited data shown in an earlier report (*1*) by one of us (H. T. D.), together with unpublished data on other cities mentioned in that article, fail to disclose a consistent relationship between the hardness of the domestic water supply and the amount of dental caries when comparisons are made among communities in the same geographical region. It seems that carefully conducted epidemiological studies will be required for an answer to this particular aspect of the dental caries problem.

FIGURE 1.

In this study, in order to equalize in so far as possible factors such as latitude, sunlight, and possibly other geographical conditions, cities not far distant from one another were selected for study. Their location is shown in figure 1. Climatological data with respect to sunlight are shown in table 2.

DESCRIPTION OF THE COMMUNAL WATER SUPPLIES [3]

Galesburg, Ill.—The public water supply of Galesburg is obtained from two 2,414-foot wells drilled to the Cambrian sandstone. The first well was drilled in 1919, installed in 1920, and has been in continuous use since. In 1928 a second well of the same depth was completed. The casing record of both wells indicates that water from the St. Peter sandstone is completely cased off. Since 1928 these two wells have furnished practically all (more than 98 percent) of the water used by the population.

Between 1924 and 1928 the common water supply consisted of approximately 60 percent from the first "Potsdam" (2,414-foot) well and 40 percent from wells in the St. Peter sandstone. The latter wells (central fire station and Brooks Street station) were drilled in 1917 and 1918, and are 1,252 and 1,245 feet deep, respectively. Both of these latter wells are cased to the St. Peter sandstone so as to exclude water from higher levels. Water history prior to 1924 is omitted, since this would be prior to the year of birth of the group of children examined and, therefore, not relevant. Since 1934 about 95 percent of the water used has been pumped from the larger of the two "Potsdam" wells, known as the "Thorpe well." Treatment is limited to chlorination, 0.2 of one part per million. Since

[3] The description and data concerning these municipal water supplies were furnished for Galesburg and Monmouth by Messrs. H. O. Chambers and George M. Crow, superintendents of the water departments, respectively; for the Macomb supply by Mr. C. W. Klassen, chief sanitary engineer, State department of public health, and for Quincy by Mr. W. R. Gelston, Jr., water works commission, Quincy, Ill.

1928, therefore, the common water supply has been obtained from one source, the 2,414-foot wells drilled to the Cambrian sandstone.

Monmouth, Ill.—The municipal water supply of Monmouth is obtained from two wells, 2,445 feet in depth. The first well was completed early in 1925, the second in 1926. Both wells obtain their water from the "Potsdam" stratum of the Cambrian sandstone. During the first 6 or 8 months of 1925 some water from the old wells in the St. Peter sandstone was added to that obtained from the first well, temporarily constituting a mixed supply. The percentage of the municipal water obtained from the old wells is not known, as the pumping records were not available. The second Cambrian well was completed early in 1926, and since that date all municipal water has been obtained from these wells.

Both wells have 90 feet of 20-inch copperoid casing, 400 feet of 18-inch cast-iron casing, and 1,200 feet of 12-inch cast-iron casing. Water from the St. Peter sandstone, which is found between 1,100 and 1,250 feet in this locality, is apparently cased off. No strainers which permit mixture of water from higher strata are present in the casing. There has been practically no change in the water level of either well since installation. Water from these two wells is more than ample for municipal needs; one well is pumped during the day and the other during the night.

Macomb, Ill.—The Macomb public water supply is obtained from two sources. The older is from the Lamoine River located near the water plant. This supply is from a small storage reservoir having an estimated storage of 2.5 million gallons and a drainage basin area of 112,000 acres. This reservoir is formed by a small channel dam in the stream. The newer supply is from Spring Lake,[4] about 5 miles northwest of the city limits, which is an impounded reservoir having a surface area of 85 acres, an estimated storage of 150 million gallons, and a drainage basin of 13,000 acres. The water purification plant was put in operation in the spring of 1911 and water has been obtained from the Lamoine River since that time. Because of the periods of low water in the stream and possible water shortage at times, the Spring Lake Reservoir was constructed in 1927. Water from either of these two sources passes through an over-and-under baffle mixing basin having a retention period of 22 minutes based upon the total plant capacity of 1.5 million gallons per day. Alum, 1–15 grains per gallon, is added for the purpose of coagulation in the mixing basin. From the mixing basin the water passes to a settling basin having a detention period of 2.8 hours. Following this treatment the water passes through the sand filters and thence to the clear well and distribution system. Post chlorination with liquid chlorine following filtration is provided at all times. For the control of red water and corrosion, hydrated lime is added to the filter influent. Activated carbon is also applied when necessary to the water before filtration for the removal of tastes and odors.

Quincy, Ill.—The Quincy common water supply is obtained from the Mississippi River. Water from this source has been in constant use for a period considerably in excess of the maximum age of the group examined. Since 1914 the plant has been operated as follows: The raw water from the Mississippi River passes through an over-and-under baffle mixing basin. Dependent upon raw water conditions, alum, 2–9 grains, is added for the purpose of coagulating suspended matter; detention in mixing basin ranges from 12 to 15 minutes. From the mixing basin, water passes to a settling basin with a detention period of 1½ hours. It then passes to a second mixing basin where lime is added for softening,[5] then to a clarifying basin for a 2½-hour detention, and then to a recarbonation basin where the carbon dioxide obtained from flue gas removes excess lime. The water is then

[4] The Spring Lake supply was being used at the time of the collection of the water sample the chemical composition of which is reported later in this paper.

[5] The softening part of the treatment was added in December 1931.

treated with ammonium sulfate and chlorine, which provide disinfection by monochloramine, after which it passes to a settling basin with a 2.6-hour detention. Following this treatment, the water passes to a rapid sand filter, then to the clear well and the distribution system. Post chlorination with liquid chlorine following filtration is provided for when necessary.

PLAN OF STUDY

The study was undertaken primarily for the purpose of obtaining further information on the differences in the amount of dental caries associated with the use of public water supplies of two dissimilar types. The plan of the study called for a comparison of Galesburg and Monmouth with Macomb and Quincy. Consequently every effort was made to have both groups as nearly alike in all relevant respects as was possible. The Galesburg and Monmouth water supplies contain about 1.8 and 1.7 parts per million of fluorides, respectively, and are producing a mild degree of mottled enamel in an appreciable percentage of those using the water during the period of susceptibility to endemic dental fluorosis. The water supplies of Macomb and Quincy are practically free from fluorides, showing only about 0.2 part per million. For the purposes of this study the group of children examined was deliberately limited to children whose permanent teeth were continuously exposed to the influence of the water under investigation.

The study was further limited to 12-, 13-, and 14-year-old white public school children, age being defined by last birthday. Selection of this segment of the school population permits the examination of a group in whom a high percentage of the permanent teeth have erupted. The results of an examination of school children of higher ages than these may be questioned from the standpoint of the representativeness of the sample because of the increasing percentage of children in the higher age groups not attending school.

The group examined was selected in the following manner. Each classroom or assembly hall was visited and the purpose of the survey explained to the children. Those children who stated that they had lived in the city continuously since birth and had always used the common water supply for domestic purposes (drinking and cooking) were assembled in a separate group. This group was then further questioned to determine whether there had been any breaks in the continuity of their residence and water consumption. If questioning elicited information which disclosed breaks in the continuity of exposure (30 days in any calendar year excepted) the child was eliminated from further study. Those remaining constituted the group continuously exposed since birth to the effects of the local water supply. In a second group were included those children born elsewhere but who had entered the community prior to 6 years of age and had resided there continuously since. In this group the permanent teeth had calcified to a varying degree while using other

water supplies, but in practically all instances the permanent teeth since eruption had been exposed to no other domestic water than the one being studied.

Because of the fewer number of children available at Monmouth and Macomb, all children falling in one or the other of the above classifications were examined. These two divisions were likewise made in the Galesburg study in order to ascertain whether or not there was any appreciable difference in the amount of dental caries in children whose permanent teeth had calcified while using a water containing 1.8 parts per million of fluorides and those whose teeth had apparently largely calcified while using waters relatively low in fluorides.[6] Since there was no apparent reason for making this classification at Quincy and in view of the larger number of children available, examinations in that city were, in the main, largely confined to children with a history of continuous use of the municipal water from birth.

Immediately after the selection of the group to be studied, and before leaving the classroom or assembly hall, the name, address, age, grade, continuity of residence and other pertinent data were recorded on a sampling card, one being made out for each child.

School _____ Serial No. _____

Name in full _____ _____
(last) (first)

Date of birth _____

Birthplace _____
(city)

Age _____
(years and months)

Grade _____ Room or class _____

Home address _____

Have you lived here continuously all your life? (check one) _____ _____
(yes) (no)

If *not*, how old were you when you moved here? _____
(years)

Have you lived here continuously since moving here? _____

Sampling card.

[6] In this group were 76 children whose histories indicated continuous exposure to the Galesburg common water from at least 6 years of age to the time of the examination. This group, however, had calcified their permanent teeth to a varying degree while using water other than the Galesburg supply. The subsequent analysis of these data revealed so many variations in water histories that break-downs of these data were not statistically possible.

It might also be noted that each child was further questioned at the time of the clinical examination, 1 to 4 days later, regarding water history. This second cross-questioning occasionally revealed discontinuities in water history of early life but the number eliminated by this second questioning was relatively small.

Specific comments with regard to the sampling in each of the four cities follow:

Galesburg.—In Galesburg there are 3 junior high schools covering the seventh, eighth, and ninth grades. The study was conducted at 2 of these schools (Hitchcock and Lombard). On the day of sampling there were present in the 3 junior high schools 1,059 twelve-, thirteen-, and fourteen-year-old children. About 70 percent, or 743, were pupils of the 2 schools where the study was made. Of these 743, cards were made out for 369 pupils, 319 of whom were examined. Of the 50 not examined, 33 were children who, on subsequent questioning during the clinical examination, were found to have had breaks in continuity of exposure, while the remainder were children absent on the day of the examination, a few not examined because of lack of time, and colored children who, because of very small numbers, did not warrant a separate classification. Of the 319 children examined, 243 gave a history of continuous use of the Galesburg city water; the remaining 76 showed breaks in continuity prior to 6 years of age but had continuously used the city water since. The 319 children examined represented about 42 percent of the total number of 12-, 13-, and 14-year-old children present in these 2 schools on the day of sampling.

Monmouth.—At the time of the examination there were enrolled 430 pupils in the sixth, seventh, eighth, and ninth grades of the Monmouth schools. Of these 430 pupils, 148, or about 34 percent, were examined. The 148 examined included all 12-, 13-, and 14-year-old white children in these grades having either of the 2 requisites of exposure described. Of the 148 children examined, 99 were children who stated that they had used the city water continuously since birth.

Macomb.—At the time of the examination there were enrolled 501 pupils in the sixth, seventh, eighth, and ninth grades of the Macomb public schools. Of this number, 338 were 12, 13, or 14 years of age. In addition, for the purposes of this study, the 60 Macomb children attending the training school of the Western Illinois State Teachers' College were combined with the public school children and together they constitute the group studied at Macomb. There was considerable difficulty in this city in finding an appreciable number of children who had used the city water continuously owing to the common practice of using water from shallow wells (20–25 feet deep) during the summer months for drinking. This custom developed as a result of the impaired palatability of the city water during the summer months because of its higher temperature.

In Macomb 112 twelve-, thirteen-, and fourteen-year-old children were examined. In this group there were 63 whose histories indicated continuous use of the city water supply. Of the remaining 49, 25 were children who had spent part of their early life elsewhere but who had continuously used the city water since at least 6 years of age. These 25 plus the 63 continuous histories, totaling 88, are the only ones actually comparable to those examined at Monmouth. The other 24 examined, children of the ninth grade, were those who had resided in the community continuously but whose history indicated use of the shallow well water each summer. In the sixth, seventh, and eighth grades, children using well water in the summer months were not examined.

Quincy.—At Quincy the eighth and ninth grades of the entire city, composed largely of 13- and 14-year-old children, are consolidated in one large junior high school. In order that there might be an equitable distribution of 12-, 13-, and 14-year-old children in the study group, all 12-year-old children with the necessary requisites of continuity of exposure were examined in 5 of the 12 elementary schools. At our request the superintendent of education selected the 5 elementary schools which in his opinion would give a representative sample of the Quincy school population of that age.

At the Quincy Junior High School on the day of sampling there were 703 twelve-, thirteen-, and fourteen-year-old pupils present.[7] In addition, in the 5 elementary schools there were present 173 twelve-year-old children, making a total of 876. Sampling cards were made out for 408 children, of whom 306 were examined. Of the 102 not examined, 23 were children who on subsequent questioning during the clinical examination were found to have had breaks in continuity of exposure; 65 were cases not examined for lack of time; and the remainder consisted of absentees and colored children. The greater number of children enrolled at Quincy permitted a high percentage of examinations of children with a history of continuous use of the public water supply since birth; the first 4 days of the clinical examination were devoted almost exclusively to the examination of children falling into this category. Of the 306 children examined, 291 gave a history of continuous use of the Quincy city water. The 306 examined represent 35 percent of the total number of 12-, 13-, and 14-year-old children present in the junior high school and of the 12-year-old children in the 5 elementary schools present on the day of sampling.

Clinical examination.—All examinations were made by a dentist using a mouth mirror and explorer with the child seated facing a window. At Galesburg and Quincy the explorers used were new double-end No. 3; at Monmouth and Macomb double-end No. 6 explorers were used. At all four cities the instruments used in the

[7] A very small percentage of this group were 12-year-old children.

examination were taken from the sterilizer and placed in a common pool from which the examiner selected the instruments to be used. Failure in coalescence of enamel lobes (pits and fissures) in which the end of the explorer caught but which showed no evidence of caries was not counted as caries. Pits or fissures showing one or more of the following criteria were counted as caries irrespective of how small the cavitation: Slight opacity around the edges, underlying dark stain suggestive of caries, or a perceptible soft feeling when the explorer was inserted in the pit or fissure. Examination of each child consumed approximately 10 minutes' time.

The personal interpretation in diagnosis is subject to some variation between examiners. An attempt was made to equalize this variation by having each of the two examiners examine approximately an equal number of children in each school. Following the collection of the filled out sampling cards, which were well mixed, the cards were numbered serially. One dentist then examined all odd numbered cases, the other, the even numbered. The clinical examinations at Monmouth and Macomb were made by Assistant Dental Surgeon F. A. Arnold, Jr., and Dr. O. S. Hoag, a dentist of the Illinois Department of Public Health; the examinations at Galesburg and Quincy were made by Dental Surgeon H. T. Dean and Dr. O. S. Hoag.[8] The clinical findings were recorded on a schedule form designed for combined dental caries and mottled enamel studies (fig. 2).

CLINICAL FINDINGS

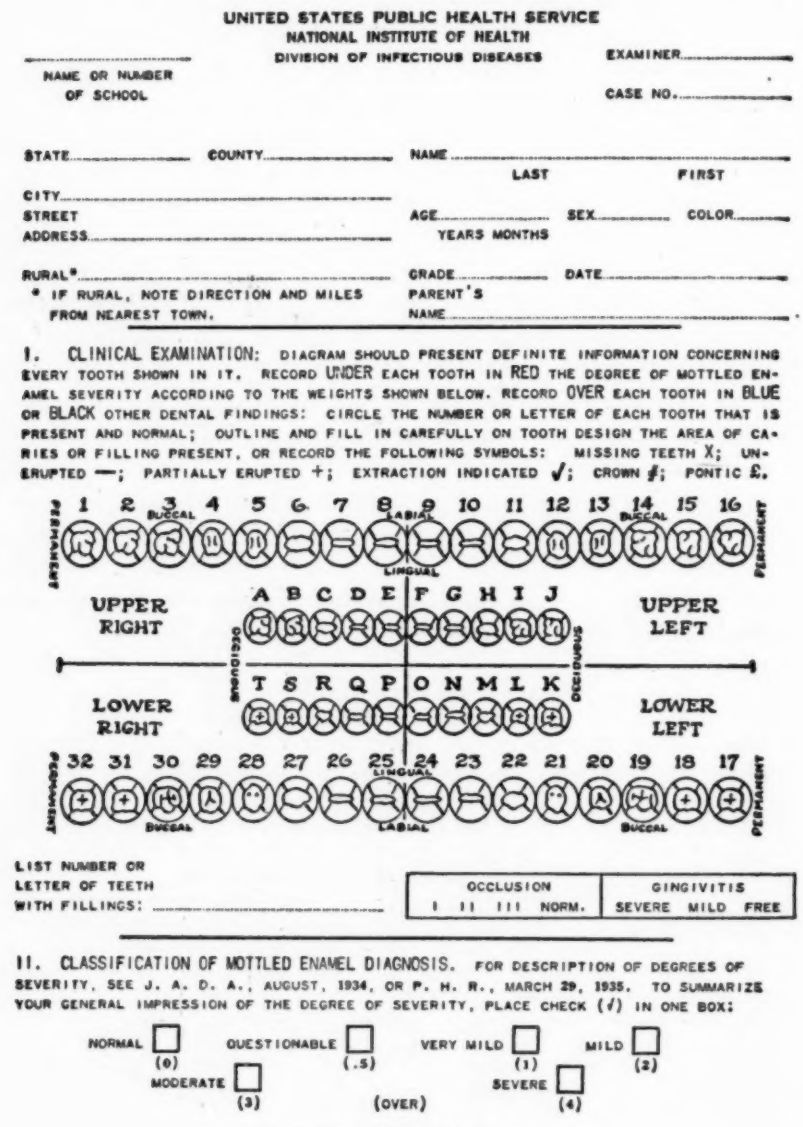
In the 4 cities studied 885 children were examined, and they were distributed according to age and sex as shown in table 3.

TABLE 3.—*Distribution of the 885 children examined, according to age and sex*

City	Total	Age in years, last birthday								
		12			13			14		
		M	F	Both sexes	M	F	Both sexes	M	F	Both sexes
	Number									
Galesburg	319	63	60	123	53	61	114	47	35	82
Monmouth	148	23	23	46	29	26	55	20	27	47
Macomb	112	15	22	37	19	26	45	11	19	30
Quincy	306	57	60	117	51	56	107	36	46	82
	Percent									
Galesburg	100.0	19.8	18.8	38.6	16.6	19.1	35.7	14.7	11.0	25.7
Monmouth	100.0	15.5	15.5	31.0	19.6	17.6	37.2	13.5	18.3	31.8
Macomb	100.0	13.4	19.6	33.0	17.0	23.2	40.2	9.8	17.0	26.8
Quincy	100.0	18.6	19.6	38.2	16.7	18.3	35.0	11.8	15.0	26.8

[8] The study at Monmouth and Macomb was made in October 1938, that at Galesburg and Quincy during December 1938.

In table 4 are shown the number of children examined, the number who were caries-free (permanent teeth), the percentage incidence of affection, and the number of carious permanent teeth per 100 children.



UNITED STATES PUBLIC HEALTH SERVICE
NATIONAL INSTITUTE OF HEALTH
DIVISION OF INFECTIOUS DISEASES

NAME OR NUMBER OF SCHOOL _____ EXAMINER _____
CASE NO. _____

STATE _____ COUNTY _____ NAME _____
LAST FIRST
CITY _____
STREET ADDRESS _____ AGE _____ SEX _____ COLOR _____
YEARS MONTHS
RURAL* _____ GRADE _____ DATE _____
* IF RURAL, NOTE DIRECTION AND MILES FROM NEAREST TOWN. PARENT'S NAME _____

I. CLINICAL EXAMINATION: DIAGRAM SHOULD PRESENT DEFINITE INFORMATION CONCERNING EVERY TOOTH SHOWN IN IT. RECORD UNDER EACH TOOTH IN RED THE DEGREE OF MOTTLED ENAMEL SEVERITY ACCORDING TO THE WEIGHTS SHOWN BELOW. RECORD OVER EACH TOOTH IN BLUE OR BLACK OTHER DENTAL FINDINGS: CIRCLE THE NUMBER OR LETTER OF EACH TOOTH THAT IS PRESENT AND NORMAL; OUTLINE AND FILL IN CAREFULLY ON TOOTH DESIGN THE AREA OF CARIES OR FILLING PRESENT, OR RECORD THE FOLLOWING SYMBOLS: MISSING TEETH X; UNERUPTED —; PARTIALLY ERUPTED +; EXTRACTION INDICATED √; CROWN ∮; PONTIC £.

PERMANENT 1 2 3 BUCCAL 4 5 6 7 8 9 LABIAL 10 11 12 13 14 BUCCAL 15 16 PERMANENT
LINGUAL
UPPER RIGHT A B C D E F G H I J UPPER LEFT
DECIDUOUS DECIDUOUS
LOWER RIGHT T S R Q P O N M L K LOWER LEFT
PERMANENT 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 PERMANENT
LINGUAL
BUCCAL LABIAL BUCCAL

LIST NUMBER OR LETTER OF TEETH WITH FILLINGS: _____

OCCLUSION				GINGIVITIS		
I	II	III	NORM.	SEVERE	MILD	FREE

II. CLASSIFICATION OF MOTTLED ENAMEL DIAGNOSIS. FOR DESCRIPTION OF DEGREES OF SEVERITY, SEE J. A. D. A., AUGUST, 1934, OR P. H. R., MARCH 29, 1935. TO SUMMARIZE YOUR GENERAL IMPRESSION OF THE DEGREE OF SEVERITY, PLACE CHECK (√) IN ONE BOX:

NORMAL ☐ (0) QUESTIONABLE ☐ (.5) VERY MILD ☐ (1) MILD ☐ (2)
MODERATE ☐ (3) (OVER) SEVERE ☐ (4)

FIGURE 2a.—Face of schedule form.

This table includes: (*a*) Those whose histories indicated continuous use of the city water from birth, and (*b*) all those in group (*a*) plus those who had used the city water continuously since 6 years of age but whose water history between birth and 6 years of age was variable.

In computing an index for showing the amount of dental caries in these population groups, it was decided to express the amount of caries

in terms of the number of carious permanent teeth per 100 children examined. The number of carious permanent teeth (both past and present) was determined by combining the aggregates of the number

III. WATER HISTORY ENUMERATOR: _____

RESIDENCE FROM BIRTH IN CHRONOLOGICAL ORDER *	DURATION (YRS.)	SOURCE OF DRINKING WATER **					
		MUNICIPAL	DEEP WELL	SHALLOW WELL	CISTERN	SPRING	OTHER
BIRTH PLACE							
2.							
3.							
4.							
5.							
6.							
7.							

WAS ABOVE HISTORY CONFIRMED BY INTERVIEW WITH CHILD'S PARENTS? YES ☐ NO ☐

BROTHERS AND/OR SISTERS IN SCHOOL NONE ( )
NAME _____ GRADE _____ SCHOOL _____
NAME _____ GRADE _____ SCHOOL _____
NAME _____ GRADE _____ SCHOOL _____

REMARKS: _____

* IGNORE CHANGES IN A DURATION OF RESIDENCE LESS THAN THIRTY DAYS IN ONE CALENDAR YEAR.

** MUNICIPAL: DESCRIBE SEPARATELY AND IN DETAIL STATING TYPE AND HOW LONG PRESENT SUPPLY HAS BEEN USED. NOTE ALL CHANGES CONCOMITANT WITH LIFE OF AGE GROUP EXAMINED.
DEEP WELL: STATE DEPTH AND CASING; OBTAIN LOG IF AVAILABLE.
SHALLOW WELL: STATE WHETHER DUG OR DRIVEN AND APPROXIMATE DEPTH.
CISTERN: NOTE WHETHER CISTERN IS TIGHT OR LEAKY.
SPRING: STATE WHETHER HOT OR COLD AND TYPE OF GEOLOGICAL FORMATION THROUGH WHICH ISSUING. IF POSSIBLE.
OTHER: WRITE IN TYPE OF WATER SUPPLY, I.E., OPEN OR IRRIGATION DITCHES, CREEKS, ETC.

FIGURE 2b.—Back of schedule form.

of times the following items were recorded on the clinical examination form: Untreated dental caries, extraction indicated, extracted teeth, and filled teeth. The sum of these four aggregates was then divided by the number of children examined and the quotient multiplied by 100. In computing this rate no single tooth is counted more than once

even though one surface may show a carious lesion and another surface a filling.[9]

TABLE 4.—*Summary of the incidence and amount of dental caries in selected 12- to 14-year-old white children of 4 Illinois cities*

City	Number of children examined	Children with one or more carious permanent teeth		Children with caries-free permanent teeth		Number of carious permanent teeth per 100 children			
						Age in years, last birthday			Total[1]
		Number	Percent	Number	Percent	12	13	14	
(A) 696 CHILDREN WITH HISTORY OF CONTINUOUS USE OF PUBLIC WATER SUPPLY									
Galesburg	243	155	63.8	88	36.2	177	207	201	194
Monmouth	99	63	63.6	36	36.4	115	213	271	208
Macomb	63	54	85.7	9	14.3	315	422	367	368
Quincy	291	279	95.9	12	4.1	563	615	732	628
(B) 885 CHILDREN EXAMINED INCLUDING THOSE IN (A) AND THOSE WHO HAVE CONTINUOUSLY USED THE CITY WATER SINCE 6 YEARS OF AGE; WATER HISTORY PRIOR TO 6, VARIABLE									
Galesburg	319	207	64.9	112	35.1	182	226	196	201
Monmouth	148	96	64.9	52	35.1	150	200	266	205
Macomb	112	96	85.7	16	14.3	346	411	453	401
Quincy	306	294	96.0	12	4.0	567	623	740	633

[1] Inasmuch as the age-sex distribution of the 4 samples (table 3) is relatively uniform, no attempt has been made to adjust for age-sex differences in the rate given as "total" in this and succeeding tables in this paper. This rate, therefore, expresses the amount of dental caries observed in the 12- to 14-year-old children taken as a group.

An analysis of the data from this study discloses a remarkable difference in both the percentage incidence of affection and the amount of dental caries present when the observations made in Galesburg and Monmouth are compared with those in Macomb and Quincy. A finding worthy of special comment is the fact that approximately 35 percent of the children examined at Galesburg and Monmouth show no evidence whatsoever of dental caries in their permanent teeth, an unusually high percentage for school children of this age group.

With respect to the data shown in section (*b*) of table 4 (all of the children examined in the four cities) it seemed desirable to show how much each of the following items contributed to the rates shown: (1) Untreated dental caries; (2) past dental caries (filled teeth); (3) far-advanced dental caries warranting extraction; and (4) missing permanent teeth (permanent anterior teeth lost because of accident excluded). These data are shown in table 5.

[9] When a single tooth disclosed both a filling and an untreated lesion, the tooth was classified as a "filled tooth."

TABLE 5.—*Summary of the number and the rate per 100 children of carious permanent teeth in 12 to 14-year-old white children of 4 Illinois cities classified on the basis of untreated caries, filled teeth, extraction indicated, or presumably missing because of caries*

City	Number of children examined	Untreated dental caries	Past dental caries (filled teeth)	Extraction indicated	Missing teeth	Total carious permanent teeth
	(A) NUMBER					
Galesburg	319	375	223	20	24	642
Monmouth	148	133	156	4	11	304
Macomb	112	280	109	19	41	449
Quincy	306	917	758	105	156	1,936
	(B) NUMBER PER 100 CHILDREN					
Galesburg		117.5	70.0	6.0	7.5	201
Monmouth		89.8	105.4	2.7	7.3	205
Macomb		250.0	97.3	16.9	36.6	401
Quincy		299.6	247.7	34.3	51.0	633

The data shown in section (*b*) of table 5 are also shown graphically in figure 3.

Interproximal caries.—Dental caries in school children is largely divided into two varieties: (*a*) That originating in the pits and fissures,

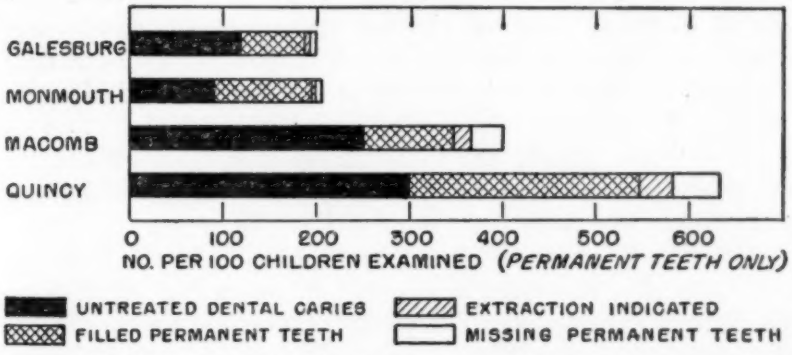


FIGURE 3.—Distribution of the four signs indicative of past or present dental caries classified according to the number per 100 children.

and (*b*) interproximal caries, or that type of smooth surface caries occurring in the neighborhood of the contact point of approximating surfaces.

In this study a striking difference was observed in these two varieties of dental caries, an unusually low amount of interproximal dental caries being present at Galesburg and Monmouth. The examination did not include the use of Roentgen rays, an ancillary aid in detecting small interproximal carious lesions, especially in the posterior teeth. Some appreciation of these differences, however, may be gleaned from a study of the 4 superior anterior teeth. These 4 upper teeth pre-

sent 8 interproximal surfaces and the amount of dental caries was calculated on the basis of the number of carious lesions per 100 surfaces. Fillings were counted as evidence of past caries. Also these tabulations were made only from the examinations of those children whose histories indicated continuous use of the municipal water throughout life. The findings recorded at Galesburg and Monmouth in contrast to those of Macomb and Quincy are shown in table 6.

TABLE 6.—*Amount of dental caries in the interproximal surfaces of the superior anterior teeth of selected children of 4 Illinois cities*

City	Number of children examined [1]	Number of proximal surfaces [2]	Number of carious surfaces	Dental caries per 100 surfaces
Galesburg	243	1,934	13	0.67
Monmouth	99	784	3	.38
Macomb	63	502	36	7.2
Quincy	291	2,312	215	9.3

[1] The histories of these children show continuous use of the municipal water throughout life.
[2] Teeth lost by accident excluded.

These differences are so great that little comment seems necessary. The 2,718 surfaces in the Galesburg and Monmouth children showed only 0.59 carious lesion per 100 surfaces. In the 2,814 tooth surfaces of the Quincy and Macomb children there were 8.9 carious lesions per 100 surfaces, or 16 times as much of this particular variety of dental caries in Quincy and Macomb as in Galesburg and Monmouth.

An unusual freedom from dental caries in anterior teeth was reported by Arnim, Aberle, and Pitney (7) in 1937. This phenomenon, too, was apparently associated with the use of waters containing more than 1.0 part per million of fluoride (F). These workers examined 204 Indian children, aged 7 to 11 years, enrolled in the Government day schools of 6 Rio Grande Pueblo villages in New Mexico and 3 Hopi villages in Arizona. The authors state that no carious lesions were observed in the 1,605 permanent incisors examined, noting further that 24 percent of these teeth had white spots in the enamel, presumably mottled enamel. The chemical analysis of the domestic waters as reported by these authors discloses fluoride concentrations that, in the instance of the New Mexico pueblo, would probably be associated with the production of the milder types of mottled enamel; the analyses from the two Arizona pueblos show concentrations in the neighborhood of the minimal threshold of toxicity, 1.0 part per million of fluoride (F), a concentration that ordinarily produces mottled enamel in about 10 percent of those continuously using it during the susceptible period. The writers note that it is doubtful if "any one child used a single source of water continuously throughout life," a remark showing the uncertainties encountered in correlat-

ing clinical observations in nomadic primitive peoples with the use, for an appreciable period of time, of a specific water supply of known mineral composition.

A short time before the above study, Steggerda and Hill (*8*) (1936) reported an unusually low incidence of dental caries in the anterior teeth of Navajo Indians in comparison with Maya Indians, various racial groups in Jamaica, and a Dutch population in Michigan. The percentage distribution of caries in individual teeth was, in the case of the Navajos, 0.6, 0.6, and 0 for the central and lateral incisors, and cuspids; for the same teeth in the Mayas, the percentages were 17.6, 9.6, and 2.4, respectively.

First permanent molar mortality.—In recent dental literature the term "tooth mortality" has appeared. This appears to be an index of value in measuring certain aspects of the dental caries problem. Recently Knutson and Klein (*9*) reported on the tooth mortality rates computed from the examinations of 4,416 children at Hagerstown, Md., defining tooth mortality as referring to "not only extracted permanent teeth but also those which are indicated for extraction and still present in the mouth." By reason of the relatively large number of children examined, the findings of these workers, reported by sex and single age groups, offer a useful standard for comparative purposes. They found "that the first permanent molars contribute no less than 90 percent of the total mortality for each age and sex group of a representative grade-school population."

For the purpose of determining how closely this index might reflect differences in the amount of dental caries in the 4 surveyed communities the first permanent molar mortality rate[10] for each community was computed as shown in table 7.

TABLE 7.—*Incidence and rate of first permanent molar mortality in 12- to 14-year-old children in 4 selected Illinois cities*

	Galesburg	Monmouth	Macomb	Quincy
Number of children examined	319	148	112	306
Number of first permanent molars missing, or extraction indicated	43	13	57	235
Number missing per 100 children examined	13.4	8.8	50.9	76.8
Percent of those examined with 1 or more missing first permanent molars	9.4	6.7	29.4	37.6

Since tooth mortality rates may be influenced by the amount of remedial treatment received by the child,[11] comparison of the number and percent of filled first molars is desirable. The findings in respect of this point are shown in table 8.

[10] In accordance with the definition of the previously cited workers (*9*), first permanent molars listed as "extraction indicated" were combined with those actually missing in computing the rates shown in table 7.

[11] There was no record of a school dental program rendering remedial treatment at Galesburg, Monmouth, or Macomb. At Quincy a part-time dentist has been employed by the Quincy public health district since 1922 for rendering dental treatment to any child of school age. This dentist works 3½ hours per morning, 6 days a week, and in 1938 inserted 1,043 fillings in permanent teeth (*10*).

TABLE 8.—*Number and percent of filled permanent first molars in all children examined in each of the 4 cities*

	Galesburg	Monmouth	Macomb	Quincy
(1) Number of first permanent molars showing past or present caries [1]	443	235	257	994
(2) Number of first molars filled	184	128	72	467
(3) Percent of (1) that are filled	41.5	54.4	28.0	47.0

[1] These totals include not only untreated dental caries and filled teeth but also missing and "extraction indicated," the number of the latter 2 items being shown in line 2, table 7.

The incidence of mottled enamel and its relation to the amount of dental caries in an endemic area.—McKay (*11*) has stated that, in spite of their defective structure, teeth with mottled enamel exhibit no greater liability to dental caries than do normally calcified teeth. In a previous article (*1*), one of us (H. T. D.) has stated that "the limited-immunity-producing factor present in the water is operative whether or not the tooth is affected by mottled enamel."

Conditions at Galesburg seemed particularly adapted to further study of this particular aspect of the problem. Here the fluoride concentration of the public water supply is just sufficiently high to produce the milder forms of mottled enamel in about 50 percent of those continuously using the city water, the other 50 percent being free of the macroscopic signs of endemic dental fluorosis.

At Galesburg there were 243 children whose histories indicated continuous use of the municipal water supply. Of this group there were 114 children (46.9 percent) who showed some form of mottled enamel, generally of a very mild type. The remainder, 129, were classified as normal or questionable. Among the 114 children with positive diagnoses of mottled enamel, the number of carious permanent teeth was 200 per 100 children; among the 129 listed as not having mottled enamel, the rate was 186 per 100 children. The factor responsible for the low amount of caries in this city was apparently operative irrespective of whether the child showed macroscopic evidence of mottled enamel or not.

It might also be noted that at Galesburg there was little variation in the incidence of mottled enamel among the three age groups examined. The 91 twelve-year-old children showed an incidence of 47.2 percent; the 87 thirteen-year-old children, 42.5 percent; and the 65 fourteen-year-old children, 52.3 percent.

In accordance with a previously described method of computing a community mottled enamel index (*12*) on the basis of the percentage distribution of clinical severity, the approximate mottled enamel index of Galesburg and Monmouth is "slight"; that of Quincy and Macomb, "negative." A survey of Galesburg and Monmouth by one of us (H. T. D.) in 1934 likewise showed an index of "slight." The detailed findings relative to mottled enamel in these four cities as observed in the present survey are shown in table 9.

TABLE 9.—*Incidence and distribution of mottled enamel according to the degree of affection*

Macroscopic signs of mottled enamel	Children with history of continuous use of public water supply				Continuous use of public water supply since 6 years of age; variable under 6			
	Galesburg	Monmouth	Macomb	Quincy	Galesburg	Monmouth	Macomb	Quincy
	NUMBER							
Total examined	243	99	63	291	76	49	49	15
Absent:								
Normal	70	6	60	288	32	17	43	15
Questionable	59	26	2	3	16	17	5	0
Present:								
Very mild	82	47	1	0	22	14	[1]1	0
Mild	29	20	0	0	6	1	0	0
Moderate	3	0	0	0	0	0	0	0
Severe	0	0	0	0	0	0	0	0
	PERCENT							
Total examined	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Absent:								
Normal	28.8	6.1	95.2	99.0	42.1	34.7	87.8	100.0
Questionable	24.3	26.2	3.2	1.0	21.1	34.7	10.2	0
Present:								
Very mild	33.8	47.5	1.6	0	28.9	28.6	2.0	0
Mild	11.9	20.2	0	0	7.9	2.0	0	0
Moderate	1.2	0	0	0	0	0	0	0
Severe	0	0	0	0	0	0	0	0
Incidence of affection	46.9	67.7	1.6	0	36.8	30.6	2.0	0

[1] During early childhood lived 3 years at Bushnell where the common water supply contains 4.0 parts per million of fluorides.

Bacteriological findings.—At the present time there seems to be a growing belief that the behavior of the oral *L. acidophilus* is a dependable index of the state of dental caries activity.

The fundamental work of the Michigan group (*13*) and others has led to a number of conclusions concerning this group of organisms and its relation to dental caries. Those of seeming major importance in the interpretation of findings dealing with the lactobacilli-caries relationship in any one individual might be restated briefly as follows:

1. Repeated positive cultures of the saliva which consistently show large numbers of *L. acidophilus* are indicative of active caries in a high percentage of cases.

2. Individuals, caries free, or in whom caries is inactive, are characterized by cultures either negative or with organisms present sporadically in low amounts. Repeated bacteriological examinations at weekly or monthly intervals are necessary for the purpose of classifying such cases if the clinical observations are to be correlated with the bacteriological findings.

3. The presence of relatively large numbers of lactobacilli may precede the development of macroscopic dental caries by as much as several months.

4. A carious lesion can only be considered active when a subsequent examination demonstrates signs of progression. Attempts to associate the findings of single clinical examinations with single cultures of the saliva oftentimes result in spurious correlations.

In any study on a single individual of the lactobacilli-caries relationship, it is essential that the foregoing conclusions be considered as guiding principles.

The bacteriological aspect of the present study, however, was epidemiological in that the unit of investigation was a population and not an individual. Interest, in other words, was centered on a group and not on an individual. With the development of increasing knowledge regarding oral *L. acidophilus* and its relation to dental caries, it seemed highly desirable to ascertain whether or not oral lactobacilli would reflect the differences in the amount of dental caries in comparable groups of children of two cities with unlike amounts of dental caries. In other words, if a sufficient number of children were sampled in each city, would the *L. acidophilus* counts reflect the amount of dental caries recorded clinically?

In order to learn whether or not group population differences in oral lactobacilli were demonstrable, a "blind test" was carried out at Galesburg and Quincy. Stimulated saliva samples were collected from approximately 200 children (186 at Galesburg; 209 at Quincy) in each city and quantitative estimations of *L. acidophilus* were made.

The bacteriological studies were conducted by Consultant Philip Jay, University of Michigan School of Dentistry, with the assistance of Assistant Dental Surgeon F. A. Arnold, Jr. In order to rule out any unconscious bias based upon a knowledge of the clinical conditions, neither one of the authors engaged in the bacteriological aspects of the study was cognizant of the clinical findings prior to the completion of the bacteriological study. The specimens of saliva were collected from the children in a room separate from the room where the clinical examinations were being made. The bottles used for collecting the saliva were identified by using the serial number assigned to the child's sampling card, the same number likewise appearing on the schedule form upon which the clinical findings were recorded. The clinical examination records were collected twice daily (noon and evening) and remained in the sole possession of one of us (H. T. D.) until the completion of the bacteriological study. Because of the necessary 4-day period of incubation of the plates and broth tubes, the clinical examinations were completed the evening before the first plates were counted.

Upon completion of the bacteriological study, the counts were recorded on the clinical records, the means of identification being the serial number, and at the same time the general clinical condition was cross-recorded on the bacteriological work cards.

For a more detailed analysis of the relationship between the clinical findings and the bacteriological estimations, a separate tabulation has been made of all children for whom both clinical and bacteriological examinations were made. The amount of dental caries in these two

groups and the quantitative distribution of the lactobacilli counts are shown in tables 10 and 11.

TABLE 10.—*Summary of the incidence and amount of dental caries in those children for whom a single L. acidophilus examination was made*

City	Number of children examined	Children with one or more carious permanent teeth		Children caries free, permanent teeth		Number of carious permanent teeth per 100 children			
						Age in years, last birthday			Total
		Number	Percent	Number	Percent	12	13	14	
Galesburg	[1] 186	114	61.3	72	38.7	170	192	223	189
Quincy	[2] 209	201	96.2	8	3.8	518	638	745	636

[1] 176 of the group were those with continuous histories since birth.
[2] 204 of the group were those with continuous histories since birth.

TABLE 11.—*Distribution of oral L. acidophilus, Galesburg and Quincy groups*

Estimated number of *L. acidophilus* per cc. of saliva	Distribution of children according to the number of *L. acidophilus* found in saliva			
	Galesburg		Quincy	
	Number	Percent	Number	Percent
Negative	52	28.0	26	12.4
Less than 100	19	10.2	17	8.1
100–1,000	25	13.4	7	3.6
1,000–3,000	10	5.4	5	2.4
3,000–12,000	22	11.8	22	10.5
12,000–21,000	20	10.8	17	8.1
21,000–30,000	10	5.4	6	2.9
30,000 and over	28	15.0	109	52.0
Total	186	100.0	209	100.0

A graphic presentation of the quantitative distribution of the *L. acidophilus* counts is shown in figure 4. It is interesting to note that the amount of dental caries (permanent teeth) in Quincy, 636 per 100 children, is 3.4 times that in Galesburg, 189 per 100 children. While it may be purely coincidental, attention might be called to the fact that the percentage of *L. acidophilus* counts of 30,000 or over is also 3.4 times as high in Quincy as in Galesburg.

Saliva studies (amylase).—Following the streaking of the plates and inoculation of the broth tubes, a number of the samples of the saliva collected on the first day were immediately packed in ice and forwarded to the National Institute of Health for determination of amylolytic activity. The specimens from Galesburg and Quincy arrived at the laboratory at temperatures of 7° and 10° C., respectively. Amylase was selected for study because it is concerned with carbohydrate (starch) degradation in the oral cavity. Considerable uncertainty likewise surrounds the evidence in the literature as to the

effect of fluorides on amylase. For details of these saliva studies, the paper by McClure (*14*) should be consulted.

Amylolytic activity of the two groups of saliva was compared in terms of total reducing sugars, calculated as maltose, resulting after a half-hour reaction period of saliva with a 1-percent soluble starch solution as substrate. Optimum conditions for the reaction were

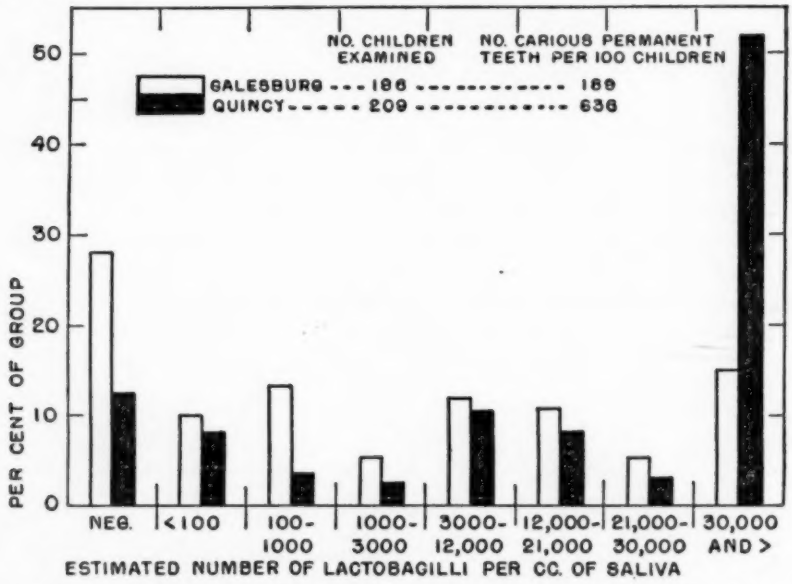


FIGURE 4.—Percentage distribution of lactobacilli in the saliva of the groups examined at Galesburg and at Quincy, classified according to the estimated amount.

maintained by the use of a suitable buffer, and the requisite sodium chloride for enzyme activation.

A total of 63 specimens of saliva from children living in Quincy averaged 105.9 ± 5.2 mg. maltose, as compared with an average of 108.7 ± 3.1 mg. of maltose for 82 specimens from children living in Galesburg. These results include all the salivas sent for biochemical study for each group, although the individual data indicate that a number of samples included in the above average data may have deteriorated following the time of collection, in spite of the low temperature maintained.

Values somewhat less than 90 mg. of maltose are thought to give evidence of loss of amylolytic activity. Table 12 gives information regarding the variations in the data.

The means of the distribution show no statistically significant differences. Subject, therefore, to possible changes in the saliva owing to the influences of field conditions associated with the collection of these samples, it would appear that the continued ingestion of a domestic water containing, on the average, 1.8 parts per million of fluorine does not change the amylolytic activity of saliva.

TABLE 12.—*Distribution of the saliva specimens by cities according to maltose-producing activity expressed in milligrams*

Maltose (mg.)	Galesburg		Quincy	
	Number	Percent of total	Number	Percent of total
(45)–50	0	0.0	4	6.3
50–90	12	14.6	7	11.1
90–100	5	6.1	6	9.5
100–110	16	19.5	11	17.5
110–120	27	32.9	22	34.9
120–130	16	19.5	7	11.1
130–(137)	6	7.3	6	9.5
Total	82		63	

Chemical analyses of the common water supplies.—In a previous study 12 consecutive monthly samples of the common water supplies of Galesburg and Monmouth were analyzed.[12] These samples were collected between November 1933 and October 1934. The fluoride concentrations quoted in the present report, 1.8 parts per million for Galesburg and 1.7 parts per million for Monmouth, represent the arithmetic mean of this series. A single sample of each supply collected recently, and reported in table 13, showed a fluoride content of 1.9 p. p. m. for Galesburg and 1.6 p. p. m. for Monmouth, values which, in relation to the mean of the 1933–34 figures, are within the range of the possible experimental error of the method of determination.

The chemical analyses of the waters from Quincy and Macomb should not be accepted literally as representing the average mineral composition of the water used by the inhabitants throughout the year.[13] As in all surface water supplies, seasonal and annual rainfall or other meteorological conditions undoubtedly influence the mineral composition of the water. Twelve consecutive monthly samples are highly desirable in a study of either surface supplies or shallow wells. The mineral composition of water from deep wells, on the other hand, ordinarily shows little fluctuation, the analyses of the samples collected at Galesburg and Monmouth in 1938 being almost identical with those collected in 1933–34.

The chemical analyses of these four samples are shown in table 13; the fluoride content was estimated by means of the zirconium-alizarin reagent (*15*).

The samples of water from Galesburg and Quincy were received in December 1938, and those from Monmouth and Macomb were received in September 1938.

[12] See Pub. Health Rep., 50: 1719–1729 (December 6, 1935).

[13] Additional data on the mineral composition of the Quincy water are on file in the office of the Water Works Commission, Quincy, Ill.

TABLE 13.—*Chemical analyses of the common water supply of Galesburg, Monmouth, Macomb, and Quincy, Ill.*[1]

	Galesburg	Monmouth	Macomb	Quincy
	Parts per million			
Residue on evaporation	1,097.2	1,048.0	217.1	159.2
Loss on ignition	91.8	59.0	52.2	30.0
Fixed residue	1,005.4	989.0	164.9	129.2
Silica (SiO_2)	11.3	11.2	3.6	11.2
Iron (Fe)	.04	.1	.07	.02
Aluminum (Al)	0	0	0	.2
Calcium (Ca)	62.2	65.0	47.1	28.2
Magnesium (Mg)	25.3	26.6	15.9	4.5
Sodium and Potassium (calculated as Na)	294.1	250.2	7.5	11.6
Carbonate (CO_3)	0	0	0	6.0
Bicarbonate (HCO_3)	297.6	279.3	178.1	20.7
Sulfate (SO_4)	352.8	407.3	38.3	55.1
Nitrate (NO_3)	3.1	3.3	1.0	3.5
Chloride (Cl)	191.0	114.5	4.0	15.3
Fluoride (F)	1.9	1.6	.2	.2
Phosphate (PO_4)	0			0

[1] Assistant Chemist C. G. Remsburg carried out the determinations other than fluoride, using mostly the methods given in the Standard Methods of Water Analysis of the American Public Health Association. The phosphate was determined colorimetrically by an adaptation of the Benedict and Theis method (J. Biol. Chem., 61: 63 (1924)).

DISCUSSION

General findings.—Marked differences in the percentage incidence and the amount of dental caries has been demonstrated between groups of 12-, 13-, and 14-year-old white public school children of two Illinois cities, Galesburg and Monmouth, where the common water supply contains 1.7–1.8 parts per million of fluorides when compared with children of like age in two other nearby Illinois cities (Quincy and Macomb) where the public water supply is practically free of fluorides (0.2 part per million).

While on the basis of our present knowledge it appears reasonable to associate the low caries rates observed at Galesburg and Monmouth with the presence of small amounts of fluorides in the domestic water, the possibility [14] that the composition of the water in other respects may also be a factor should not be overlooked. For this reason it seems highly desirable that dental caries studies should be accompanied by complete chemical analyses of the domestic waters, including a search for the comparatively rare elements. This seems particularly applicable in those instances where the presence or ab-

[14] The western half of Oklahoma seems to furnish some support for this concept. An analysis of the dental caries rates of this State as reported in Public Health Bulletin No. 226, together with observations made by one of us (HTD) in connection with mottled enamel studies, indicate that the dental caries rates are appreciably lower in that part of the State in general west of the Permian outcropping. The part of Oklahoma seemingly characterized by low dental caries rates lies east of the Texas and Oklahoma Panhandles, a region where mottled enamel is generally endemic and dental caries rates low. The slope topographically is eastward. But the increased freedom from dental caries in this region may not be attributed entirely to fluoride in the water since preliminary tests have indicated concentrations of fluoride insufficient to produce considerable mottled enamel. Sporadic instances, however, of very mild mottled enamel have been observed at Lawton, Chickasha, Shawnee, and other localities in this region. This would indicate that small quantities of fluorides have been consumed by these populations. Whether or not concentrations of fluoride insufficient to produce considerable mottled enamel may still be sufficient to lower the dental caries rates remains to be determined.

sence of fluorides may not entirely explain the observed differences in dental caries rates.

Considering the apparent similarity in the population groups and the method followed in the selection of the samples examined, it is difficult from an epidemiological standpoint to ascribe these differences to any other cause than the common water supply. If this ascription proves correct, the possibility of partially controlling dental caries through the public water supply becomes of more than academic interest.

A brief recapitulation of the major findings of this study follows:

Incidence and amount of dental caries.—In the 319 children examined at Galesburg and the 148 examined at Monmouth, the number of carious permanent teeth per 100 children was 201 and 205, respectively. At Macomb and Quincy, examinations of 112 and 306 children disclosed rates of 401 and 633. In other words, there was approximately twice as much dental caries at Macomb and more than three times as much at Quincy [15] as was observed at Galesburg or Monmouth. The differences in the percentages of children caries-free with respect to their permanent teeth is of additional interest. At Galesburg and Monmouth about 35 percent of those examined were caries free; in Macomb and Quincy, only 14 and 4 percent, respectively, were free from dental caries.

Interproximal or smooth surface caries.—An unusual difference noted was that in interproximal, or smooth surface, caries. Using the 8 surfaces of the 4 superior anterior teeth for illustrative purposes and limiting the comparisons in all 4 cities to only those children who used the city water supply continuously throughout life, the 2,718 surfaces in Galesburg and Monmouth showed only 0.59 carious lesions per 100 surfaces. In Macomb and Quincy, in 2,814 surfaces there were 8.9 carious lesions per 100 surfaces, or 16 times as much of this particular type of dental caries in Macomb and Quincy as in Galesburg and Monmouth. Such differences are arresting in their relation to the study of the genesis of dental caries. Is a markedly increased vigor in the exciting cause of dental caries required for the development of dental caries on smooth surfaces in contradistinction to that originating in pits and fissures where a focus of carbohydrate degradation is provided for by the failure in coalescence of the lobes of enamel? These surprising differences, demonstrable in school children, recall a recent report of Rosebury (*16*) who, in a study of experimental dental caries in rats, differentiates between occlusal fissure caries and proximo-gingival caries in the rat molars. This latter lesion he considers

[15] It must also be remembered that the amount of dental caries at Quincy is not unusually high (633); it merely appears high in relation to that of Galesburg. According to the data in Public Health Bulletin No. 226 (*2*), for the same age groups of white children, the neighboring city of Davenport, Iowa, shows 656 carious permanent teeth per 100 children, Minneapolis and St. Paul, Minnesota, 578 and 590, respectively, while seven Wisconsin cities using common water supplies low in fluorides, previously cited in another article (*1*), show rates ranging from 646 to 917.

analogous to proximal caries in man. In the rat the proximogingival type of lesion is produced under conditions comparable to those instrumental in producing the occlusal fissure type but with a markedly lower frequency, and as Rosebury remarks "under conditions that suggest a somewhat distinctive etiology."

Relation between mottled enamel and dental caries.—At Galesburg where the approximate community mottled enamel index is "slight," there was no significant difference in the amount of caries between those children with mottled enamel and those without. The amount of dental caries in the 114 children with mottled enamel was 200 per 100 children examined; in the 129 listed as not having mottled enamel, it was 186 per 100 children. It would appear that the factor responsible for the low amount of caries in this city was operative irrespective of whether the child showed macroscopic evidence of mottled enamel.

Bacteriological findings.—Quantitative estimation of the amount of oral *L. acidophilus* in the saliva of 186 children in Galesburg and 209 children at Quincy was made. The group population differences in the oral lactobacilli closely reflected the differences in the amount of dental caries. The percentage of bacteriological counts of 30,000 or over was 3.4 times higher in Quincy than in Galesburg, a ratio equivalent to the differences noted clinically in the same children, 636 to 189 carious permanent teeth per 100 children.

Saliva studies.—A study of saliva specimens from 63 children in Quincy and 82 from Galesburg showed no significant difference in the averages between the two groups in the rate of amylolytic activity.

SUMMARY

1. Two Illinois cities (Galesburg and Monmouth), using a domestic water closely similar in source and mineral composition, show similarly low dental caries rates, 201 and 205 carious permanent teeth per 100 children, respectively.

2. Two nearby cities (Macomb and Quincy), using a domestic water dissimilar in type and mineral composition from that of Galesburg and Monmouth, are characterized by dental caries rates double and treble those observed at Galesburg and Monmouth.

3. The Galesburg and Monmouth water supplies contain 1.8 and 1.7 parts per million of fluoride (F), the Macomb and Quincy waters only 0.2 part per million. While it seems reasonable to associate the low dental caries rates with the higher fluoride content of the communal water supplies, the possibility that the composition of the domestic waters, other than the fluorine content, may be a factor should not be overlooked.

4. Using the approximal surfaces of the 4 superior incisors as a basis of measurement, there was 16 times as much interproximal caries in Macomb and Quincy as in Galesburg and Monmouth.

5. The amount of *L. acidophilus* in the saliva closely reflected the difference in the dental caries rates between Galesburg and Quincy. Bacteriological studies were not made at Monmouth and Macomb mainly because of the smaller number of children available for study in these two cities.

6. The quantity of amylase secreted in the saliva disclosed no group population differences between Galesburg and Quincy.

7. From an epidemiological standpoint, it is difficult to ascribe these differences to any cause other than the common water supply.

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EARLY STATE HOSPITALS FOR SEAMEN

THE FIRST IN AMERICA PROVIDED BY THE STATE OF VIRGINIA, THE SECOND, SOME YEARS LATER, BY MASSACHUSETTS

By JOHN W. TRASK, *Medical Director, United States Public Health Service*

The medical care of sick and injured seamen has always presented a problem to maritime countries. The seaman has to follow his ship, and most often his illnesses and injuries come upon him when away from home and in ports where he is not known and where he has no claim upon the local hospitals or the community. By the very nature of his vocation he is usually unprepared to meet the pecuniary requirements of an illness or disability of more than the briefest duration. Sick or injured, and in need of medical care, he cannot remain on his vessel, and, if put ashore, in the absence of hospitals to which he can be admitted, his lot would be usually little, if any, better.

One does not wonder that in America the States early attempted to solve the problem of making medical care available to seamen when taken sick away from home. They knew the necessity of having ships, and seamen to man them, for the transportation abroad of the products of farm and plantation and the bringing back of the things obtainable only in foreign countries. With their long coast line the importance of a merchant marine both in peace and in war had been repeatedly demonstrated.

MARINE HOSPITAL, NORFOLK COUNTY, VA.

In 1782 the legislature of Virginia, in an effort to meet the need of seamen, passed an act providing for the collection of money from the captains of vessels for the purpose of building and supporting a hospital for disabled seamen (*1*). The act provided that the "several and respective" naval officers within the Commonwealth should receive from the captains or commanders of vessels, at the time of their entrance or clearance, one shilling for every seaman on board their vessels. The money thus collected was to be applied towards building and supporting a hospital for disabled seamen and mariners.

Five years later, in 1787, the Virginia Legislature passed an act providing for the building of a marine hospital (*2*). The first paragraph of the act stated: "Whereas the tax imposed on seamen hath produced a fund sufficient for the purpose of erecting a hospital for the reception of aged, sick, and disabled seamen, and it is just and proper that the same should be applied to the laudable purpose for which it was originally intended."

The second paragraph authorized the Governor to appoint seven commissioners for the purpose of erecting a hospital for aged, sick, and disabled seamen at Washington in the County of Norfolk. The Commissioners were empowered to purchase a piece of land in the town of Washington and to contract for the building thereon of a commodious house, or houses, fit for the reception and accommodation of such aged, sick, and disabled seamen as they might from time to time think proper to admit. They were to provide a surgeon, keeper, and matron with necessary nurses, and all necessaries for their comfortable support and maintenance. All expenses were to be paid out of the "Marine fund."

Some difficulty was evidently encountered, either in the construction or maintenance of the hospital, as the legislature passed an act on December 24, 1790 (*3*), providing that the Commissioners appointed for the purpose of establishing the marine hospital be authorized to dispose of the said marine hospital to the Congress of the United States for the purpose of its original institution. The money received in payment was to be applied to the discharge of the contract for erecting the hospital, and the residue, if any, was to be divided between the towns of Norfolk and Portsmouth.

Two years later the General Assembly passed an act, the purpose of which was to prevent masters of ships putting ashore sick or injured seamen without making provision for their care (*4*). It provided that if the master of a ship put ashore any sick or disabled seaman without making provision for his care, maintenance, or cure, he should be fined $60, the money to go to the overseers of the poor of the county where the seaman was put ashore.

In 1794 an act was passed imposing a tax on seamen (*5*). This act provided, "That a tax of 30 cents shall be, and is hereby imposed, on every sailor, to be paid by the captain, master, or owner of the vessel on her return from a voyage at the time of making entry of such vessel." This tax was to be deducted from the seamen's wages, and the money collected was to be applied under the direction of the executive towards finishing and supporting the marine hospital in the town of Washington, County of Norfolk. The collection of the tax was limited to seamen on vessels arriving at ports on the James, the York, the Rappahannock, and the Elizabeth Rivers.

Four years later the State decided to dispose of the hospital, and on January 20, 1798, the legislature passed an act authorizing the Governor to offer the marine hospital for sale to the Congress of the United States for use as a hospital for seamen, the price asked being the amount still owing to the contractor for the construction work (*6*). It was further provided that if the Congress refused the terms offered, the Governor was to sell the hospital for the best price obtainable, and the proceeds of the sale were to be applied towards liquidating the amount still owing to the contractor, and the balance, if any, was to be paid into the State treasury.

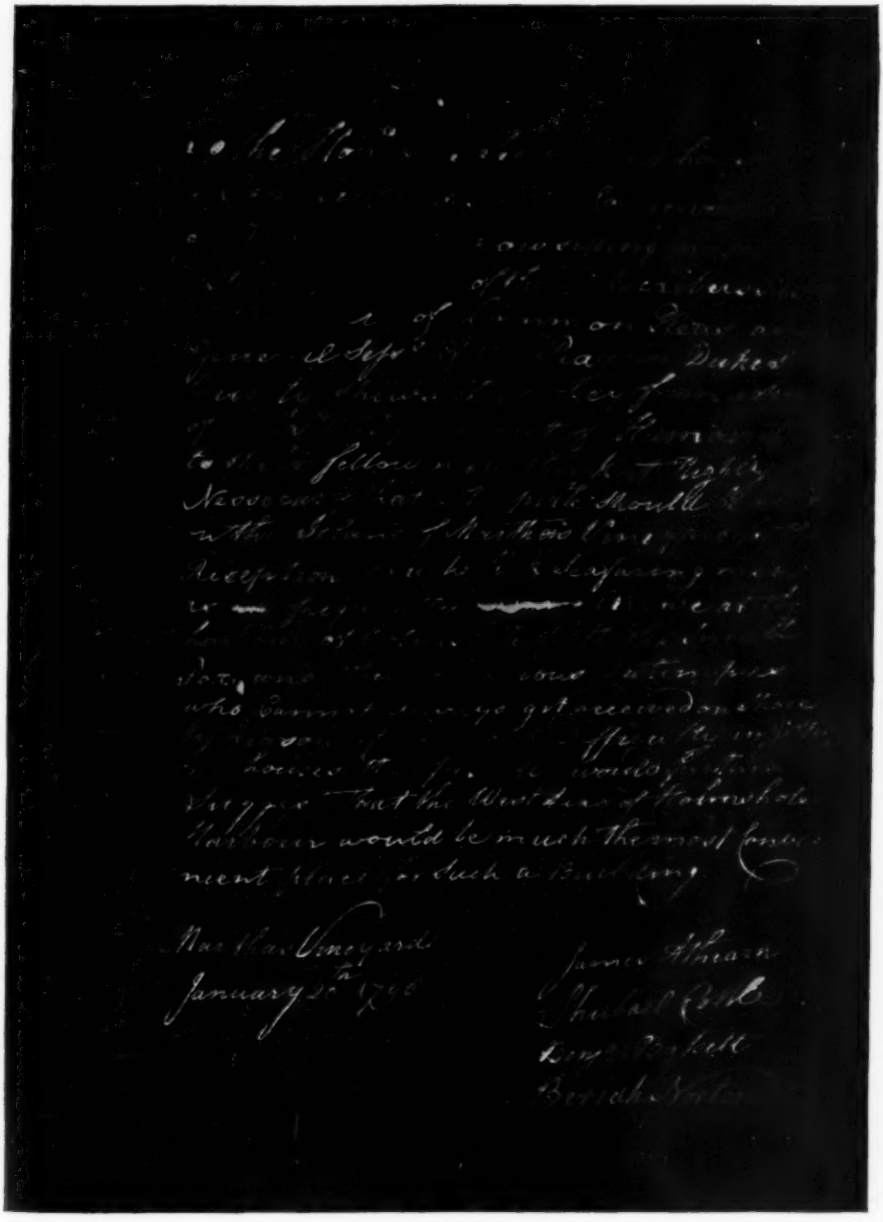
The hospital was purchased by the United States from the State of Virginia in 1801, and continued in use as a marine hospital under the act of Congress approved July 16, 1798, creating the United States Marine Hospital Service (*7*).

SEAMEN'S HOSPITAL, MARTHA'S VINEYARD, MASS.

In January 1798, four residents of the island of Martha's Vineyard, Mass., presented a memorial to the Massachusetts State Legislature inviting attention to the need for a hospital on the island for the care of sick seamen. The memorial read:

> To the Hon.[b1] The Senate and House of Representatives of the Commonwealth of Massachusetts now sitting in Boston the memorial of the Subscribers Justices of the Court of Common Pleas and General Sess.[s] of the Peace in Dukes County shews that they from a Sence of their Duty and out of Humanity to their fellow men think it Highly Necessary that a Hospitle should be built on the Island of Martha's Vineyard for the Reception of Such Sick Seafaring men as frequently arrive at the harbour of Holms hole with the Small Pox and Other Contagious Distempers who Cannot always git received on Shore by reason of the great Difficulty in gitting houses therefor. We would further Suggest that the West Side of Holms hole Harbour would be much the most Convenient place for Such a Building.
>
> Martha's Vineyard. (Signed) James Athearn.
> January 20th 1798. Shubael Cottle.
> Benja. Bassett.
> Beriah Norton.

In response to this memorial the legislature in the following month (February 17, 1798) passed a resolution to the effect that a hospital should be built on the Island of Martha's Vineyard at, or near, the harbor of Holmes Hole for the reception of such sick persons as might arrive there from the sea. It was to be erected at the discretion and under the direction of his Excellency, the Governor, who was requested to appoint a suitable agent or agents for the purpose of carrying the resolution into effect. The sum of $700 was appropriated for the purpose (*8*). The council records show that on the day that the resolution was passed, a warrant was drawn on the State treasury for $700 in favor of James Athearn and Beriah Norton, agents for building the hospital, to defray the expense thereof.



Facsimile of memorial.

In the "Acts and Laws" of Massachusetts there is recorded the passage of an additional resolve on February 21, 1800, authorizing the Governor to appoint a suitable person to be keeper of the hospital at Martha's Vineyard and to appoint an agent to supply the hospital with necessary furniture.

Following an inquiry by the writer there was published in the Vineyard Gazette of Martha's Vineyard, Mass., on Friday, February 3, 1939, an account of what is left of the old hospital. The cellar hole is all that remains, and not far away there still stands a gravestone on which the epitaph may be read:

In memory of
Samuel Lockwood
of St. John, New Brunswick
who departed this life
October 28, 1801
Aged 42 years, 5 months and 15 days

In the Vineyard Gazette of December 5, 1890, there appeared an account of this old hospital written by Passed Assistant Surgeon Charles E. Banks, of the United States Marine Hospital Service, then in charge of the Marine Hospital at Vineyard Haven. Dr. Banks' account contains details and items of local color and interest. In commenting on the existence of the gravestone mentioned, he ventured the thought that the epitaph was probably to the memory of the first sailor who died in the hospital.

REFERENCES

(1) Hening's Statutes at Large, Virginia, vol. 11, ch. 35, p. 161, passed October 1782.
(2) Hening's Statutes at Large, Virginia, vol. 12, ch. 14, p. 494, passed December 20, 1787.
(3) Hening's Statutes at Large, vol. 13, ch. 38, p. 158.
(4) Virginia Statutes at Large, New Series, by Samuel Shepherd, vol. 1, ch. 46, sec. 9, p. 146.
(5) Virginia Statutes at Large, New Series, vol. 1, p. 307.
(6) Virginia Statutes at Large, New Series, vol. 2, ch. 22, p. 93.
(7) Christian, S. L.; Marine hospitals and beneficiaries of the Public Health Service. Pub. Health Rep., 51: 799–811 (June 19, 1936).
(8) Acts and Laws of the Commonwealth of Massachusetts, 1796–97, Resolves 1797, ch. 96, p. 573.

CHARACTER OF POLIOMYELITIS IN CHARLESTON, S. C.

According to a report received from Passed Assistant Surgeon A. G. Gilliam, of the United States Public Health Service, a rough tabulation of the first 67 cases of poliomyelitis occurring in Charleston and the county outside of Charleston since early in November, showed the following approximate degrees of severity:

33 either completely recovered or prognosis excellent for complete recovery; 23 moderately severely affected, with a fair to good prognosis; 5 severely affected; 5 dead; 1 status unknown.

In the Public Health Reports for May 12, 1939, page 799, a brief summary was presented of poliomyelitis in Charleston and the State outside of Charleston up to May. Later reports show the following, with data for the United States for comparison: Week ended May 6, in Charleston 9 cases, in entire State 13, United States 32; week ended May 13, Charleston 19, State 22, United States 47; week ended May 20, Charleston 16 (7 from county outside of Charleston), State 28, United States 43. In the above mentioned 3 weeks there were reported in Georgia 3, 5, and 0 cases, respectively, and in Florida 3, 6, and 1 case.

DERMATITIS AND COEXISTING FUNGOUS INFECTIONS AMONG PLATE PRINTERS

The Public Health Service was requested by the director and employees of a large printing establishment to make a study of skin lesions which, over a period of many years, had incapacitated, either totally or partially, several of the plate printers employed there. The condition was known among the plate printers as "ink poisoning." The exact substance responsible for the skin lesion was unknown; however, fungous infections as well as the inks used were suspected. In accordance with this request an investigation was made for the purpose of studying the relationship between the industrial environment and the skin diseases and specifically to determine (1) the potential skin hazards associated with this industry, (2) the incidence and type of the dermatitis among the employees, and (3) the exact etiologic factor in each case of dermatitis, and (4) to develop methods of control.

The results of the dermatological survey,[1] which included past and present medical histories, examination of the skin, patch testing, and intensive mycological examinations, are correlated with the findings of the occupational survey which included a description of the occupations and the process of plate printing, as well as the occupational exposures to inks, cleaning materials, fungi, and other substances.

There were 1,091 employees in this establishment. Of these, 378 had a severe exposure to inks and cleaning materials. The majority of the cases of skin diseases occurred among these 378 men. Three hundred and sixty-five of these 378 employees were examined, as well as a control group of 24.

During the printing operation the printer passes his bare hand over the engraved plate to remove the excess of ink left by the press rollers. The hands are then wiped on the printer's apron to remove excess ink and then on a molded block of calcium carbonate in preparation for the next plate.

[1] Public Health Bulletin No. 246, same title as above. By Paul A. Neal, Passed Assistant Surgeon, and C. W. Emmons, Senior Mycologist. Available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

In cleaning the hands, all printers from a given section washed in a common sink containing light mineral oil. Soap, stiff brushes, potassium carbonate, sharp sand, and paper towels were other cleaning agents used, and each man used one or more of these materials.

Of the men examined, 16 had lesions which were classified as being of a chronic, eczematous, vesicular type; 2 had lesions of a chronic dry eczematous type; 8 had, or showed evidence of having had, a folliculitis, 3 had lesions of a chronic, eczematous, fissure type; and 3 had evidence of dermatophytids. The duration of the dermatitis varied from 1 to 30 years. Some of the men had been incapacitated for work by the severity of the lesions. In most cases, but not in all, the lesions cleared when the patient avoided exposure to inks and cleaning materials and reappeared when he returned to work. Thirty-seven men whose hands were free from dermatitis at the time of examination had a past medical history of occupational dermatitis of the hands. It was estimated that the total loss of working time because of dermatitis of the hands was 13 years for one man during the period 1910–36.

For mycological examination, scales or the roofs of vesicles were taken when possible from the hands and routinely from the feet. A part of the material from each patient was examined under the microscope to determine whether fungi were present, and the remainder of each specimen was planted on agar slants. Pathogenic fungi were found on the feet of 33 percent of the men by microscopic examination, of 26.2 percent by culture, and of 36.4 percent by one or both of these methods, while 49.7 percent of the men had either clinical or laboratory evidence, or both, of dermatophytosis of the feet. No dermatophytes were found by direct examination or by culture on the hands of any of the men with dermatitis.

Epidermophyton floccosum was isolated from 5 of the men, *Trichophyton purpureum* from 18, and *T. mentagrophytes* from 71. As these strains were isolated within a short period of time they provided excellent material for a comparative study. Single spore isolates were secured from 28 representative strains. They provided an intergrading series of forms and gave clear evidence of the variability of these species.

There was no significant difference in the incidence of dermatophytosis of the feet in men with present evidence or past history of dermatitis of the hands and in those men not exposed to inks or without dermatitis.

Men exposed to inks (with or without dermatitis) and the controls were patch tested to inks and to the component parts of inks. Of the 121 individuals who were patch tested to the 13 inks used, 13 gave positive reactions. No positive tests were obtained among 70 patch-test controls. Fifty percent of the plate printers who were tested and who had dermatitis at the time of examination gave positive reactions

to the inks. Of the plate printers with a past history of dermatitis of the hands, 12.1 percent gave positive reactions. Results of the patch tests with component parts of inks were variable.

Recommendations for the control of the dermatitis include the following:

1. Pre-employment examinations and the exclusion from certain occupations of persons with a history of allergic disorders, constitutional conditions predisposing to skin diseases, and seborrheic disorders of the skin.

2. Periodic medical examinations to determine the incidence and cause of cases of dermatitis appearing in the plant. The treatment recommended is the removal of the causative agent from the working environment and protection against secondary infections, chiefly by cleanliness. Strong antiseptics and intensive physical therapeutic measures are considered inadvisable in this type of industrial dermatitis.

3. Protective measures, proper materials and methods for cleansing the hands, and full cooperation of the employees.

4. The provision of appropriate sanitary measures, such as sanitary shower baths and washrooms, which should be thoroughly scrubbed daily with soap and hot water, the use of sandals in the shower and washrooms (walking on the floor of the washrooms in the bare feet should be prohibited), and separate lockers for work clothes and street clothes for plate printers, and attention to the cleanliness of these lockers.

DEATHS DURING WEEK ENDED MAY 6, 1939

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 6, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	8,117	[1] 8,126
Average for 3 prior years	[2] 8,551	
Total deaths, first 18 weeks of year	166,759	158,993
Deaths under 1 year of age	459	[1] 529
Average for 3 prior years	[2] 558	
Deaths under 1 year of age, first 18 weeks of year	9,716	9,774
Data from industrial insurance companies:		
Policies in force	67,459,306	68,836,988
Number of death claims	15,602	12,167
Death claims per 1,000 policies in force, annual rate	12.1	9.2
Death claims per 1,000 policies, first 18 weeks of year, annual rate	11.7	10.0

[1] Data for 87 cities.
[2] Data for 86 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (----) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Cases of certain diseases reported by telegraph by State health officers for the week ended May 13, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938. cases	1934–38, median
NEW ENG.												
Maine [1]	6	1	4	1	266	44	----	1	845	140	133	133
New Hampshire	0	0	0	0	----	----	----	----	10	1	61	61
Vermont	0	0	0	1	----	----	----	----	1,903	142	183	58
Massachusetts	8	7	2	7	----	----	----	----	1,232	1,048	381	763
Rhode Island	8	1	0	0	----	----	----	----	710	93	1	74
Connecticut	0	0	5	5	6	2	1	1	3,351	1,129	30	249
MID. ATL.												
New York	10	26	38	38	[2]8	[2]12	[2]4	[2]8	929	2,320	3,754	3,027
New Jersey	11	9	18	18	5	4	7	7	79	66	934	934
Pennsylvania	15	30	28	28	----	----	----	----	69	135	2,925	2,925
E. NO. CEN.												
Ohio	7	9	5	24	----	----	----	57	31	40	1,801	1,801
Indiana	10	7	9	13	12	8	1	12	21	14	670	609
Illinois [1]	21	32	36	36	50	77	8	21	28	43	1,599	1,599
Michigan [3]	21	20	15	8	11	10	----	----	508	481	3,890	367
Wisconsin	2	1	4	3	139	79	32	32	1,587	903	2,833	1,613
W. NO. CEN.												
Minnesota	4	2	2	4	6	3	1	1	568	293	239	326
Iowa	2	1	2	6	10	5	3	2	298	147	348	311
Missouri	1	1	9	18	3	2	15	41	9	7	427	437
North Dakota	15	2	1	1	270	37	15	2	657	90	170	30
South Dakota	0	0	2	1	38	5	----	----	1,751	233	----	4
Nebraska	8	2	4	4	15	4	----	----	1,523	399	215	215
Kansas	14	5	8	8	14	5	2	3	232	83	462	462
SO. ATL.												
Delaware	39	2	2	1	----	----	----	----	177	9	27	27
Maryland [3 4]	3	1	6	6	----	----	5	8	743	241	116	429
Dist. of Col	49	6	2	8	----	----	----	----	2,522	312	15	94
Virginia	15	8	13	12	289	154	----	----	1,424	760	353	496
West Virginia	11	4	3	3	62	23	33	27	5	2	455	141
North Carolina [1]	4	3	12	18	9	6	2	7	520	356	1,724	237
South Carolina	16	6	6	6	1,063	389	94	115	60	22	169	76
Georgia [1]	18	11	5	5	194	117	----	----	123	74	282	----
Florida [1]	3	1	8	7	124	41	4	2	464	154	137	50

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended May 13, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median
E. SO. CEN.												
Kentucky	17	10	7	9	5	3	9	10	82	47	286	382
Tennessee [1]	4	2	7	7	136	77	19	28	185	105	134	112
Alabama [1]	7	4	7	9	350	199	35	47	262	149	352	164
Mississippi [2]	5	2	7	5	------	------	------	------	------	------	------	------
W. SO. CEN.												
Arkansas	15	6	10	5	238	96	27	50	136	55	240	16
Louisiana [1]	19	8	9	12	19	8	5	17	162	67	13	63
Oklahoma	20	10	0	5	223	111	25	25	614	305	178	66
Texas [1]	11	13	27	32	333	402	159	171	419	506	110	450
MOUNTAIN												
Montana [4]	19	2	1	1	300	32	------	2	5,860	626	42	42
Idaho [4]	0	0	0	0	10	1	9	6	847	83	65	22
Wyoming [4 5]	22	1	0	1	------	------	------	------	1,309	60	19	28
Colorado [4 5]	67	14	22	7	19	4	------	------	2,041	424	299	299
New Mexico	12	1	2	2	74	6	1	2	161	13	14	66
Arizona	0	0	1	1	478	39	32	32	270	22	19	62
Utah [3 4]	0	0	2	1	129	13	------	------	854	86	293	40
PACIFIC												
Washington [4]	3	1	0	1	------	------	------	------	3,808	1,235	48	197
Oregon [4]	0	0	6	2	249	50	18	18	333	67	25	43
California	13	16	24	31	43	53	42	42	1,815	2,213	640	731
Total	11	288	381	411	100	2,121	608	920	639	15,800	27,121	27,121
19 weeks	18	8,468	10,035	10,570	356	143,546	40,333	98,748	550	258,619	613,134	504,033

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median
NEW ENG.												
Maine [1]	0	0	0	0	0	0	0	0	30	5	11	12
New Hampshire	0	0	0	0	0	0	0	0	51	5	21	13
Vermont	0	0	0	0	0	0	0	0	134	10	9	7
Massachusetts	1.2	1	1	2	0	0	0	0	225	191	423	233
Rhode Island	0	0	0	0	0	0	0	0	99	13	12	14
Connecticut	0	0	1	1	0	0	0	0	193	65	111	108
MID. ATL.												
New York	1.6	4	4	6	0.4	1	0	0	229	572	727	904
New Jersey	0	0	2	2	1.2	1	0	0	311	261	95	204
Pennsylvania	4	8	4	4	0	0	0	1	166	327	293	479
E. NO. CEN.												
Ohio	1.5	2	2	5	0.8	1	1	0	285	371	286	501
Indiana	0	0	0	3	0	0	2	0	235	158	80	114
Illinois [1]	1.3	2	3	8	1.3	2	0	0	275	420	393	575
Michigan [3]	1.1	1	1	3	0	0	1	1	370	350	398	398
Wisconsin	0	0	0	1	0	0	0	0	257	146	131	335
W. NO. CEN.												
Minnesota	0	0	1	1	0	0	0	0	118	61	149	163
Iowa	0	0	0	0	0	0	1	0	152	75	91	91
Missouri	0	0	1	6	0	0	0	0	82	64	125	79
North Dakota	7	1	0	0	0	0	0	0	44	6	36	41
South Dakota	0	0	2	0	8	1	0	0	120	16	23	16
Nebraska	0	0	0	2	0	0	0	0	88	23	47	76
Kansas	0	0	2	2	0	0	0	0	151	44	83	83

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended May 13, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median
SO. ATL.												
Delaware	0	0	0	0	0	0	0	0	39	2	7	6
Maryland [3 4]	3	1	2	2	0	0	0	0	99	32	74	46
Dist. of Col	0	0	0	1	0	0	0	0	97	12	18	17
Virginia	0	0	3	6	0	0	0	0	30	16	21	24
West Virginia	2.7	1	1	5	0	0	0	0	48	18	30	48
North Carolina [1]	2.9	2	2	2	1.5	1	2	0	25	17	22	22
South Carolina	2.7	1	0	1	60	22	0	0	0	0	3	3
Georgia [1]	0	0	0	2	8	5	0	0	12	7	7	7
Florida [1]	3	1	0	1	18	6	1	0	24	8	3	3
E. SO. CEN.												
Kentucky	3	2	6	6	0	0	1	0	83	48	46	38
Tennessee [1]	0	0	3	4	0	0	0	0	101	57	20	20
Alabama [1]	4	2	8	3	1.8	1	1	1	7	4	6	6
Mississippi [3]	2.5	1	0	0	2.5	1	1	0	3	1	5	6
W. SO. CEN.												
Arkansas	0	0	1	1	0	0	1	1	17	7	6	8
Louisiana [1]	5	2	3	2	2.4	1	0	0	24	10	13	13
Oklahoma	0	0	0	1	0	0	0	0	46	23	18	18
Texas [1]	2.5	3	3	3	0	0	1	1	31	37	63	63
MOUNTAIN												
Montana [4]	0	0	0	0	0	0	1	1	271	29	10	15
Idaho [4]	0	0	0	0	0	0	0	0	92	9	3	3
Wyoming [4 3]	22	1	0	0	0	0	0	0	44	2	4	7
Colorado [4 1]	0	0	3	1	0	0	0	0	226	47	47	47
New Mexico	0	0	0	0	0	0	1	0	161	13	29	21
Arizona	0	0	0	1	0	0	0	0	86	7	5	16
Utah [3 4]	0	0	0	0	0	0	0	0	209	21	21	21
PACIFIC												
Washington [4]	0	0	0	2	0	0	0	0	117	38	25	40
Oregon [4]	0	0	0	0	5	1	1	0	89	18	37	37
California	0.8	1	3	3	2.5	3	0	4	121	147	197	197
Total	1.5	37	62	115	1.9	47	16	22	152	3,823	4,284	5,783
19 weeks	2	934	1,542	2,664	0.8	371	375	395	197	94,223	109,484	129,276

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14 1938, cases
NEW ENG.											
Maine [1]	0	0	0	0	6	1	0	1	296	49	28
New Hampshire	0	0	0	0	0	0	0	0	20	2	1
Vermont	0	0	0	0	54	4	0	0	831	62	35
Massachusetts	0	0	0	0	1	1	0	2	240	204	134
Rhode Island	0	0	0	0	0	0	0	0	733	96	32
Connecticut	0	0	0	0	3	1	1	1	297	100	155
MID. ATL.											
New York	0	0	0	0	3	7	8	8	193	481	519
New Jersey	0	0	0	0	4	3	3	1	324	272	189
Pennsylvania	0	0	0	0	3	5	10	10	156	307	162

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended May 13, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases	1934–38, median	May 13, 1939, rate	May 13, 1939, cases	May 14, 1938, cases
E. NO. CEN.											
Ohio	14	18	4	0	2	2	14	5	169	220	240
Indiana	77	52	26	4	3	2	5	2	82	55	6
Illinois [1]	7	11	39	18	2	3	17	6	150	229	132
Michigan [3]	26	25	0	0	2	2	1	4	182	172	296
Wisconsin	7	4	5	6	4	2	0	1	243	138	187
W. NO. CEN.											
Minnesota	8	4	8	8	2	1	2	2	58	30	12
Iowa	91	45	20	20	12	6	2	1	38	19	28
Missouri	55	43	16	1	0	0	2	3	30	23	34
North Dakota	0	0	5	5	7	1	0	0	37	5	29
South Dakota	53	7	5	5	0	0	0	0	0	0	27
Nebraska	23	6	5	12	0	0	0	0	23	6	13
Kansas	11	4	11	11	0	0	0	1	78	28	149
SO. ATL.											
Delaware	0	0	0	0	0	0	0	0	216	11	15
Maryland [3 4]	0	0	0	0	3	1	7	5	43	14	70
Dist. of Col	0	0	0	0	0	0	1	1	267	33	11
Virginia	0	0	0	0	4	2	6	6	75	40	80
West Virginia	0	0	0	0	3	1	5	5	54	20	84
North Carolina [1]	1	1	2	1	3	2	8	3	336	230	388
South Carolina	0	0	0	0	19	7	3	3	262	96	90
Georgia [1]	2	1	1	0	8	5	5	9	93	56	106
Florida [1]	0	0	0	0	12	4	8	4	136	45	32
E. SO. CEN.											
Kentucky	5	3	14	0	3	2	0	6	23	13	49
Tennessee [1]	4	2	2	1	11	6	3	3	71	40	25
Alabama [1]	0	0	1	0	9	5	6	4	62	35	57
Mississippi [3]	5	2	0	0	8	3	1	2	------	------	------
W. SO. CEN.											
Arkansas	35	14	2	1	10	4	3	2	52	21	34
Louisiana [1]	0	0	0	0	29	12	9	14	24	10	44
Oklahoma	80	40	12	2	18	9	1	2	28	14	36
Texas [1]	4	5	17	6	11	13	12	7	145	175	270
MOUNTAIN											
Montana [4]	19	2	8	9	9	1	1	0	37	4	82
Idaho [4]	0	0	14	3	0	0	1	1	51	5	10
Wyoming [4 5]	0	0	0	7	0	0	4	0	0	0	7
Colorado [4 5]	24	5	3	5	5	1	2	0	327	68	40
New Mexico	12	1	0	0	12	1	0	1	568	46	19
Arizona	110	9	12	0	25	2	1	1	98	8	24
Utah [3 4]	20	2	0	0	0	0	1	0	755	76	60
PACIFIC											
Washington [4]	3	1	22	9	9	3	2	3	83	27	145
Oregon [4]	109	22	19	8	5	1	1	1	179	36	20
California	3	4	25	18	7	8	14	11	163	199	366
Total	13	333	298	250	5	134	170	146	154	3,820	4,572
19 weeks	14	6,779	9,805	4,219	5	2,210	2,374	2,374	163	76,445	81,119

[1] Typhus fever, week ended May 13, 1939, 40 cases as follows: Maine, 1; Illinois, 1; North Carolina, 4; Georgia, 12; Florida, 3; Tennessee, 1; Alabama, 7; Louisiana, 1; Texas, 10.
[2] New York City only.
[3] Period ended earlier than Saturday.
[4] Rocky Mountain spotted fever, week ended May 13, 1939, 17 cases as follows: Maryland, 1; Montana, 3; Idaho, 1; Wyoming, 3; Colorado, 1; Utah, 2; Washington, 1; Oregon, 5.
[5] Colorado tick fever, week ended May 13, 1939, 7 cases as follows: Wyoming, 4; Colorado, 3.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningitis, meningococcus	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
April 1939										
Florida	0	22	57	41	780	15	3	34	1	19
Georgia	2	32	3,270	144	717	39	4	56	0	9
Idaho	1	1	51	----	576	----	1	30	18	6
Iowa	1	37	262	----	900	----	1	545	200	2
Massachusetts	4	11	----	3	4,068	----	1	770	0	8
Nebraska	0	22	81	----	1,461	----	0	175	62	0
Pennsylvania	31	115	----	----	530	----	2	1,351	0	26
Texas	7	103	7,398	223	1,808	162	4	229	100	48
West Virginia	10	28	1,033	----	53	1	2	151	2	9

April 1939

	Cases
Anthrax:	
Massachusetts	1
Chickenpox:	
Florida	269
Georgia	222
Idaho	54
Iowa	242
Massachusetts	721
Nebraska	117
Pennsylvania	3,514
Texas	1,268
West Virginia	161
Conjunctivitis; infectious:	
Georgia	5
Idaho	6
Dengue:	
Texas	6
Dysentery:	
Florida (amoebic)	4
Georgia (amoebic)	10
Georgia (bacillary)	7
Iowa (bacillary)	2
Massachusetts (bacillary)	7
Pennsylvania (bacillary)	1
Texas (amoebic)	8
Texas (bacillary)	52
Encephalitis, epidemic or lethargic:	
Iowa	3
Massachusetts	2
Pennsylvania	2
Texas	4
German measles:	
Florida	3
Idaho	11
Iowa	1

April 1939—Continued

	Cases
German measles—Con.	
Massachusetts	96
Pennsylvania	62
Hookworm disease:	
Florida	458
Georgia	836
Leprosy:	
Texas	3
Mumps:	
Florida	148
Georgia	285
Idaho	46
Iowa	182
Massachusetts	709
Nebraska	94
Pennsylvania	2,507
Texas	371
West Virginia	169
Ophthalmia neonatorum:	
Massachusetts	75
Texas	5
Puerperal septicemia:	
Georgia	1
Rabies in animals:	
Florida	1
Texas	16
Relapsing fever:	
Texas	2
Rocky Mountain spotted fever:	
Idaho	6
Septic sore throat:	
Florida	9
Georgia	100
Iowa	10
Massachusetts	30
Nebraska	5
West Virginia	9

April 1939—Continued

	Cases
Tetanus:	
Georgia	1
Pennsylvania	1
Trachoma:	
Idaho	2
Texas	6
Trichinosis:	
Pennsylvania	1
Tularaemia:	
Georgia	20
Pennsylvania	1
Texas	4
Typhus fever:	
Florida	6
Georgia	27
Pennsylvania	1
Texas	37
Undulant fever:	
Florida	7
Georgia	16
Idaho	2
Iowa	2
Massachusetts	2
Pennsylvania	10
Texas	37
Vincent's infection:	
Florida	13
Whooping cough:	
Florida	206
Georgia	148
Idaho	22
Iowa	52
Massachusetts	802
Nebraska	45
Pennsylvania	1,260
Texas	574
West Virginia	138

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1939

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,679	5.80	266	0.92
Arizona	268	6.50	168	4.08
Arkansas	1,173	5.73	247	1.21
California	2,634	4.28	1,542	2.51
Colorado	179	1.67	66	.62
Connecticut	220	1.26	99	.57
Delaware	285	10.92	38	1.46
District of Columbia	586	9.35	247	3.94
Florida	1,270	7.60	115	.69
Georgia	2,469	8.00	95	.31
Idaho	41	.83	17	.34
Illinois	2,534	3.22	1,226	1.56
Indiana	548	1.58	106	.31
Iowa	256	1.00	121	.47
Kansas	286	1.53	106	.57
Kentucky	1,175	4.02	377	1.29
Louisiana	509	2.39	86	.40
Maine	21	.25	39	.46
Maryland	1,258	7.49	277	1.65
Massachusetts	416	.94	384	.87
Michigan	1,338	2.77	519	1.07
Minnesota	266	1.00	156	.59
Mississippi	2,853	14.10	2,516	1.24
Missouri	526	1.32	112	.28
Montana	103	1.91	24	.45
Nebraska	66	.48	54	.40
Nevada	17	1.68	8	.79
New Hampshire	25	.49	9	.18
New Jersey	941	2.17	259	.60
New Mexico	182	4.31	44	1.04
New York	5,787	4.47	2,152	1.66
North Carolina [1]				
North Dakota	25	.35	27	.38
Ohio	1,311	1.95	560	.83
Oklahoma	666	2.61	66	.26
Oregon	140	1.36	81	.79
Pennsylvania	1,363	1.34	171	.17
Rhode Island	87	1.28	39	.57
South Carolina	1,791	9.55	254	1.35
South Dakota	17	.25	34	.49
Tennessee	997	3.45	389	1.34
Texas	4,168	6.75	717	1.16
Utah	21	.40	31	.60
Vermont	13	.34	4	.10
Virginia	1,854	6.85	189	.70
Washington	315	1.90	272	1.64
West Virginia	356	1.91	150	.80
Wisconsin	64	.22	135	.46
Wyoming	3	.13	4	.17
Total	43,102	3.43	14,598	1.16

Reports from cities of 200,000 population or over

Akron, Ohio [2]				
Atlanta, Ga	436	14.52	92	3.06
Baltimore, Md	802	9.60	172	2.06
Birmingham, Ala	419	14.24	53	1.80
Boston, Mass	135	1.70	141	1.77
Buffalo, N. Y	141	2.34	38	.63
Chicago, Ill	1,723	4.70	866	2.36
Cincinnati, Ohio	217	4.59	112	2.37
Cleveland, Ohio	274	2.90	57	.60
Columbus, Ohio	18	.57	21	.67
Dallas, Tex	208	6.84	100	3.29
Dayton, Ohio	75	3.38	36	1.62

See footnotes at end of table.

Reports from cities of 200,000 population or over—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Denver, Colo	95	3.15	42	1.39
Detroit, Mich	539	2.97	219	1.21
Houston, Tex	409	11.41	95	2.65
Indianapolis, Ind	19	.49	16	.41
Jersey City, N. J	52	1.60	8	.25
Kansas City, Mo.[1]				
Los Angeles, Calif.[2]				
Louisville, Ky	338	9.97	57	1.68
Memphis, Tenn	252	8.63	104	3.56
Milwaukee, Wis.[2]				
Minneapolis, Minn	60	1.20	48	.96
Newark, N. J	356	7.84	118	2.60
New Orleans, La	103	2.10	61	1.25
New York, N. Y	4,330	5.78	1,809	2.41
Oakland, Calif.[1]				
Omaha, Nebr	22	.98	11	.49
Philadelphia, Pa	533	2.66		
Pittsburgh, Pa	383	5.43	23	.33
Portland, Oreg	111	3.46	66	2.06
Providence, R. I.[1]				
Rochester, N. Y	36	1.05	35	1.02
St. Louis, Mo	218	2.59	60	.71
St. Paul, Minn	45	1.57	13	.45
San Antonio, Tex	124	4.74	61	2.33
San Francisco, Calif	165	2.39	195	2.83
Seattle, Wash	136	3.51	136	3.51
Syracuse, N. Y	121	5.37	5	.22
Toledo, Ohio [1]				
Washington, D. C	586	9.35	247	3.94

[1] No report for current month.
[2] Not reporting.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 6, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	160	131	53	7,328	707	2,295	21	417	27	1,419	------
Current week [1]	88	162	48	4,065	432	1,411	14	326	14	1,048	------
Maine:											
Portland	0	------	0	0	3	3	0	1	0	14	32
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	0	17
Manchester	0	------	0	0	0	0	0	0	0	0	9
Nashua	0	------	0	0	0	0	0	0	0	0	9
Vermont:											
Barre	0	------	0	0	0	0	0	1	0	0	5
Burlington	0	------	0	0	0	0	0	0	0	0	9
Rutland	0	------	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston	1	------	1	146	15	43	0	8	0	24	226
Fall River	0	------	1	0	1	6	0	0	0	2	37
Springfield	0	------	0	27	1	1	0	2	0	0	31
Worcester	1	------	0	10	6	6	0	1	0	27	53
Rhode Island:											
Pawtucket	0	------	0	3	0	1	0	0	0	0	11
Providence	0	------	0	80	5	4	0	3	0	60	63
Connecticut:											
Bridgeport	0	------	0	11	3	2	0	2	0	0	33
Hartford	0	------	0	58	3	9	0	1	0	3	45
New Haven	0	2	1	304	3	7	0	0	0	6	36

[1] Figures for South Bend, St. Joseph, and Little Rock estimated; reports not received.

City reports for week ended May 6, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York:											
Buffalo	0	----	0	186	11	33	0	10	0	26	133
New York	13	14	2	173	81	247	0	83	0	58	1,547
Rochester	1	3	0	139	6	24	0	2	0	12	60
Syracuse	0	----	0	304	0	10	0	0	0	38	40
New Jersey:											
Camden	1	1	1	0	1	7	0	1	0	3	21
Newark	1	4	0	3	3	62	0	3	1	46	94
Trenton	0	----	0	0	2	6	0	3	0	5	41
Pennsylvania:											
Philadelphia	4	3	3	41	25	65	0	20	1	69	454
Pittsburgh	1	2	5	0	10	16	0	4	0	23	173
Reading	1	----	1	4	1	0	0	0	0	0	22
Scranton	0	----	0	1	----	9	0	----	0	5	----
Ohio:											
Cincinnati	1	----	2	2	8	23	0	4	0	0	112
Cleveland	1	26	2	6	7	56	0	6	1	26	178
Columbus	2	3	3	2	7	6	1	5	0	9	94
Toledo	0	3	1	11	1	15	0	2	0	19	74
Indiana:											
Anderson	0	----	0	0	2	1	0	0	0	4	10
Fort Wayne	0	----	0	1	3	5	0	2	0	0	30
Indianapolis	1	----	3	3	7	39	3	5	0	35	92
Muncie	0	----	0	0	1	0	0	0	0	0	19
South Bend	----	----	----	----	----	----	----	----	----	----	----
Terre Haute	0	----	1	0	0	1	0	1	0	0	15
Illinois:											
Alton	0	----	0	0	1	1	0	0	0	0	7
Chicago	9	2	2	15	32	245	0	42	0	89	694
Elgin	0	----	0	0	0	6	0	0	0	3	13
Moline	0	----	0	1	1	0	0	0	0	1	10
Springfield	0	----	0	0	2	10	0	1	0	15	19
Michigan:											
Detroit	11	----	0	21	12	109	0	7	0	76	222
Flint	1	----	0	32	1	26	0	0	0	1	15
Grand Rapids	0	----	0	2	1	24	0	0	0	0	36
Wisconsin:											
Kenosha	0	----	0	0	0	5	0	0	0	12	10
Madison	0	----	0	130	0	5	0	0	0	5	10
Milwaukee	0	----	0	1	8	51	0	2	0	36	106
Racine	1	----	0	2	0	6	0	0	0	1	11
Superior	0	----	0	3	0	0	0	0	0	0	9
Minnesota:											
Duluth	0	----	0	1	1	5	0	1	0	3	32
Minneapolis	0	----	1	146	8	22	3	1	0	21	131
St. Paul	0	1	1	51	8	12	0	3	0	5	98
Iowa:											
Cedar Rapids	0	----	----	0	----	0	0	----	0	0	----
Davenport	0	----	----	0	----	0	10	----	0	2	----
Des Moines	0	----	0	0	0	35	5	0	1	0	29
Sioux City	0	----	----	5	----	2	0	----	0	0	----
Waterloo	0	----	----	3	----	10	1	----	0	1	----
Missouri:											
Kansas City	0	----	0	2	7	17	0	3	0	0	112
St. Joseph	----	----	----	----	----	----	----	----	----	----	----
St. Louis	1	2	1	2	12	28	0	5	0	16	214
North Dakota:											
Fargo	0	----	0	0	0	0	0	0	0	0	4
Grand Forks	0	----	----	0	----	0	0	----	0	0	----
Minot	0	----	0	1	0	0	0	0	0	0	4
South Dakota:											
Aberdeen	0	----	----	14	----	0	16	----	0	0	----
Sioux Falls	0	----	0	0	0	0	0	0	0	0	6
Nebraska:											
Lincoln	0	----	----	140	----	0	0	----	0	6	----
Omaha	1	----	0	13	5	1	1	1	0	1	59
Kansas:											
Lawrence	0	2	0	0	0	0	0	0	0	0	4
Topeka	0	----	0	3	2	2	1	1	0	1	35
Wichita	0	----	0	5	2	2	0	0	0	1	31
Delaware:											
Wilmington	0	----	0	0	4		0	0	0	1	28
Maryland:											
Baltimore	2	2	1	199	13	25	0	6	0	22	182
Cumberland	0	----	0	1	0	0	0	0	0	0	10
Frederick	0	----	0	0	0	0	0	0	0	0	5
Dist. of Col.:											
Washington	2	1	1	314	8	14	0	6	1	28	165

City reports for week ended May 6, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Virginia:											
Lynchburg	0	------	0	75	1	1	0	0	0	11	7
Norfolk	0	1	0	23	4	2	0	0	0	4	19
Richmond	0	------	0	268	1	1	0	1	0	0	46
Roanoke	0	------	0	1	1	0	0	0	0	4	11
West Virginia:											
Charleston	0	1	0	0	1	0	0	0	0	1	25
Huntington	0	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	0	0	0	2	0	1	0	16	17
North Carolina:											
Gastonia	0	------	------	1	------	0	0	------	0	0	------
Raleigh	0	------	0	0	0	0	0	1	0	6	6
Wilmington	0	------	0	3	0	1	1	1	1	2	7
Winston-Salem	0	------	0	9	0	0	0	0	0	1	11
South Carolina:											
Charleston	0	26	0	0	3	0	0	0	0	1	24
Florence	0	------	0	0	2	0	0	0	0	0	11
Greenville	1	------	0	1	1	0	0	0	0	4	13
Georgia:											
Atlanta	0	40	3	0	3	4	0	4	0	1	73
Brunswick	0	------	0	4	1	0	0	0	0	4	5
Savannah	0	15	1	1	2	1	0	0	0	9	36
Florida:											
Miami	0	1	0	0	4	0	0	1	0	1	30
Tampa	0	------	0	113	1	0	0	2	0	4	27
Kentucky:											
Ashland	2	------	0	0	1	0	0	0	0	0	7
Covington	0	------	0	0	2	2	0	2	0	0	12
Lexington	0	------	0	1	0	2	0	0	0	0	21
Louisville	0	------	0	7	4	7	0	3	0	4	49
Tennessee:											
Knoxville	0	3	0	0	1	1	0	2	0	0	29
Memphis	0	------	2	2	2	18	0	5	0	21	76
Nashville	0	------	0	1	2	5	0	1	1	7	40
Alabama:											
Birmingham	0	3	1	2	7	0	0	6	1	2	68
Mobile	0	1	1	7	1	0	0	0	3	0	22
Montgomery	0	2	------	6	------	0	0	------	0	1	------
Arkansas:											
Fort Smith	0	4	------	4	------	0	0	------	0	0	------
Little Rock	------	------	------	------	------	------	------	------	------	------	------
Louisiana:											
Lake Charles	0	------	0	10	1	0	0	0	0	0	2
New Orleans	8	------	1	23	12	8	0	9	2	2	116
Shreveport	0	------	1	7	4	0	0	2	0	2	45
Oklahoma:											
Oklahoma City	0	------	0	20	2	4	5	0	0	0	34
Tulsa	2	------	------	66	------	2	0	------	1	0	------
Texas:											
Dallas	0	------	0	0	4	7	1	4	0	1	45
Fort Worth	0	10	0	10	2	1	0	3	1	3	24
Galveston	0	------	0	0	2	0	0	2	0	0	14
Houston	1	------	0	39	9	1	0	8	1	0	70
San Antonio	0	2	1	0	2	0	0	5	0	0	73
Montana:											
Billings	0	------	0	0	0	0	0	1	0	0	4
Great Falls	0	------	0	37	0	2	0	0	0	0	8
Helena	0	------	0	7	0	0	0	0	0	0	5
Missoula	0	------	0	1	0	3	0	0	0	0	3
Idaho:											
Boise	0	------	0	5	0	1	0	0	0	0	8
Colorado:											
Colorado Springs	1	------	0	18	2	5	0	0	0	0	16
Denver	11	------	0	44	3	7	0	3	1	24	80
Pueblo	0	------	1	120	1	0	0	0	0	15	8
New Mexico:											
Albuquerque	0	------	0	1	1	0	0	4	0	1	10
Utah:											
Salt Lake City	0	------	0	4	2	4	0	0	0	14	31
Washington:											
Seattle	0	------	0	234	2	9	0	4	0	8	89
Spokane	0	1	1	202	3	1	0	2	0	0	40
Tacoma	1	------	0	6	3	0	0	1	0	0	31
Oregon:											
Portland	0	1	0	0	6	2	0	0	0	2	72
Salem	0	------	------	1	------	0	0	------	0	0	------
California:											
Los Angeles	8	5	0	425	6	28	0	6	0	59	204
Sacramento	2	------	0	107	2	6	3	0	0	1	19
San Francisco	0	1	1	35	3	8	0	9	0	12	169

City reports for week ended May 6, 1939—Continued

State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	1	0
New York:			
Buffalo	1	1	0
New York	3	0	1
Syracuse	0	0	1
Pennsylvania:			
Philadelphia	1	0	0
Pittsburgh	0	1	0
Illinois:			
Chicago	2	1	0
Maryland:			
Baltimore	1	0	0
District of Columbia:			
Washington	1	0	0
South Carolina:			
Charleston	0	0	0
Louisiana:			
Lakes Charles	1	0	0
New Orleans	2	1	0
Shreveport	0	1	0
Oklahoma:			
Oklahoma City	0	0	1
Texas:			
Houston	2	0	0
California:			
San Francisco	0	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 2; Philadelphia, 1; Topeka, 2.
Pellagra.—Cases: Baltimore, 1; Lynchburg, 1; Charleston, S. C., 1; Atlanta, 3; Savannah, 3; Birmingham, 1; Sacramento, 1.
Typhus fever.—Cases: Baltimore, 1; Wilmington, N. C., 1; Atlanta, 1; Lake Charles 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended April 22, 1939.—During the week ended April 22, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	1				1	3
Chickenpox			2	95	134	8	17	16	82	354
Diphtheria		2	7	31	2	2				44
Dysentery		1		3	1					5
Influenza		104			245	1	10		106	466
Lethargic encephalitis					1					1
Measles		10		231	845	1		23	2	1,112
Mumps		1		18	54	43	3	2	7	128
Pneumonia		13			45	1			20	79
Scarlet fever		3	14	46	148	19	11	35	17	293
Smallpox						8				8
Trachoma									2	2
Tuberculosis	1	12	7	108	61	2		3	8	202
Typhoid and paratyphoid fever		1	3	14	1	1	3		1	24
Whooping cough		3	4	52	149	5	31	9	77	330

CUBA

Provinces—Notifiable diseases—4 weeks ended February 4, 1939.—During the 4 weeks ended February 4, 1939, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	4	4	10	2	3	24
Chickenpox		1		4	3	1	9
Diphtheria		23		2	2	2	29
Hookworm disease		58				3	61
Leprosy		3	1	1			5
Malaria	17	8	3	32	7	84	151
Measles		2	1	17			20
Scarlet fever		2			1		3
Trachoma		7					7
Tuberculosis	16	118	19	18	6	103	280
Typhoid fever	23	140	9	26	8	72	278
Whooping cough				1			1
Yaws						4	4

SWEDEN

Notifiable diseases—March 1939.—During the month of March 1939, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Poliomyelitis	20
Diphtheria	6	Scarlet fever	4,777
Dysentery	8	Syphilis	26
Epidemic encephalitis	1	Typhoid fever	6
Gonorrhea	983	Undulant fever	8
Paratyphoid fever	11	Weil's disease	3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Jan. 1–28, 1939	Week ended—												
						February 1939				March 1939				April 1939				
						4	11	18	25	4	11	18	25	1	8	15	22	29
Afghanistan: Kabul	C		18															
China:																		
Amoy	C		7															
	D		3															
Canton	C	12																
Foochow	C	40	77	118	6													
	D	21	5	7	2													
Hankow	C	2																
Hong Kong	C	46	29	11	5													
	D	21	20	9	2													
Kwantung Province	C	142																
	D	26																
Macao	C	112	43	1													1	
	D		10	1														
Shanghai	C	401	32	10														
Swatow	C	12	7	1														
Yunnanfu[1]																		
Chosen (Korea)	C	2																
	D	1																
India	C	34,396	11,391	6,004	3,871	1,606	1,254	975	1,080	1,007	1,467	1,877						
	D	17,568	6,516	3,978	1,924	847	640	499	541	459	683	827						
Allahabad	C		2							[2] 1								
Assam	C	2,253	3,555	2,863	427	51	13	32	17	37	51	77	73	59	53	50	33	
	D	921	1,980	1,838	295	32	12	14	9	10	19	27	42	26	20	25	21	
Bassein	C											1			1		1	
Bengal Presidency	C	9,443	12,553	14,235	4,477	917	832	689	719	818	1,107	1,411	1,605	1,816	2,132	1,882		
	D	5,048	7,175	8,073	2,307	492	431	353	330	392	508	641	756	788	940	917		
Bombay Presidency	C	1,496	1,037	513	258	135	42		28	48	36	11	3					
	D	663	452	181	111	56	18		13	14	13	4	3					
Calcutta	C	114	136	114	59	4	29	34	51	48	71	87	109	147	219	208	190	199
Cawnpore	C	4									1	1	1				2	1
	D	1											1					

Central Provinces and Berar	C	8,028	1,135	228	95	8	18	1	34	4	3	18	46	17	47	37	44	39
Chittagong	C			1								[3] 1	1	2		1	3	6
Delhi	D																[3] 1	
Howrah	C	126	32	168	98	51	75	63	66	109	120	108	145					
Madras Presidency	C	1,663	253	568	1,464	405	290	199	103	40	83	29	49					
	D	733	115	211	627	201	135	98	62	22	37	15	18					
Madras	C	4	4	3				1	2	1			1					
	D	2	2	1				1	1									
Negapatam	C		5	7	2													
	D		1	2														
Northwest Frontier Province	C	26	6															
Orissa Province	C	33	2	20	36	7	22	14	30	11	15	14	16	11	19	29	58	44
Rangoon	C	1																4
Tirumalaivasal	C					3		2										
India (French):																		
Chandernagor Territory	C		1		2			1			12		4					
Karikal Territory	C	1		1	5		25	15	1									
Pondichery Province	C	3																
Indochina (French):																		
Annam Province	C	7																
Tonkin Province	C	77																
Japan:																		
Fukuoka prefecture—Wakamatsu	C	3																
Hiroshima prefecture—Fukuyama	C	3																
Siam:																		
Bangkok	C														[3] 1		1	2
Smud Prakar Province	C												5	5	7	1		

[1] Information dated Nov. 30, 1938, stated that cholera had appeared in villages near Yunnanfu, China. In 1 village of approximately 1,000 persons, 500 were said to have died.
[2] Suspected.
[3] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Jan. 1–28, 1939	Week ended—												
						February 1939				March 1939				April 1939				
						4	11	18	25	4	11	18	25	1	8	15	22	29
Algeria: Algiers	C											1						
Belgian Congo	C			1							1	2						
Bolivia. (See table below.)																		
Brazil. (See table below.)																		
British East Africa:																		
Kenya	C	1		1				3										
Uganda	C	63	27	9	14	11	5	8	6	6	5	3	10	6		5		
	D	62	28	9	14	11	5	7	6	5	5	4	10	6		5		
Dutch East Indies: Java and Madura	C	150	98	135	252													
	D	145	97	135	242													
Ecuador:																		
Guayaquil	C		2							1							2	
	D		2														2	
Plague-infected rats			3			1				1			2					
Loja	C					[2] 4												
Pueblo Viejo	C							3										
Riobamba	C							[3] 16										
	D							15										
Egypt: Asyut Province	C				1	1	4	1	[4] 26	10	6	2	4	5		10	7	13
Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District:—																		
Hamakua Mill Sector		6	13	40														
Honokaa														1				
Kaiwiki				1														
Kapulena																1		
Kukaiau				10	6	1				2		1						
Paauhau Sector		10	12	7	3			1			1		4					
India	C	2, 139	1, 723	1, 931	2, 015	589	739	1, 033	1, 082	556	1, 372	1, 770						
	D	975	737	872	970	277	361	304	449	378	577	857						
Allahabad	D								[5] 1									
Bassein	C									1		2						
Plague-infected rats			1									1						
Bombay Presidency	C	106	136	101	51	17	2		8	11	8		14					
	D	63	65	61	29	8	3		2	4	9		7					
Calcutta	C													[5] 1				

Central Province and Berar	C	584	430	677	715	170	343	480	421	440	585	522	509	454	608	557	295	
Cochin	C	1	2															
	D		2															
Plague-infected rats		13	6	6	1													
Coorg Province	C																4	
Madras Presidency	C	382	215	135	140	55	49	27	33	17	5	5	1					
	D	156	93	61	53	19	20	10	15	13	3	2	1					
Rangoon	C				3				[5]1									
	D				2													
Indochina (see also table below): Pnom-Penh	C																	1
Madagascar. (See table below.)																		
Peru. (See table below.)																		
Siam:																		
Bisnulok Province	C				1	14	11	4	4	1								
	D				1	1	1	2	1									
Lampang Province	C						1											
Prae	C				3										1	2		
Svargalok Province	C				11	13	2	1	1	1	1							
Tak Province	C			3	7		1	1	1									
Tunisia: Tunis	C	2	2	2												1		
Plague-infected rats			1		2		3											
Union of South Africa	C			2	8		[6]9		[6]9		[6]11		[6]11				[6]6	
Cape Province—Port Elizabeth	C	1		1														
	D			1														
Orange Free State	C			5		2	2				3		3		1			
Transvaal	C											1	6					
United States.[7]																		

[1] Including plague in the United States and its possessions.
[2] Unofficially reported.
[3] Pneumonic.
[4] Includes 4 cases of pneumonic plague.
[5] Imported.
[6] For 2 weeks.

[7] Last reported human case, Aug. 30, 1937, Fresno County, Calif. Intensive plague work is being conducted in the western States and detailed reports of plague-infection found in animals and insect hosts are published currently in the PUBLIC HEALTH REPORTS. The following summarizes recent reports for 1938 and 1939: *Arizona*—Insects, Sept. 27, 1933; *California*—Ground squirrels, October, December 1938, Mar. 1, 1939; insects, October, December 1938, Mar. 3, 1939; *Nevada*—Insects Apr. 7–8, 1939; *New Mexico*—Kangaroo rat, Apr. 15, 1939; prairie dogs, September 1938, insects, September 1938; *Washington*—Insects, March and Apr. 13, 1939.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		October 1938	November 1938	December 1938	January 1939	February 1939	March 1939
Bolivia	C		1				
Brazil:							
Alagoas State	C	1		5	19		
Parahiba State	C			1	1		
Pernambuco State	C	20	17	17	15		
Rio de Janeiro State	C		11	1			
Indochina: Cambodia	C					2	
Madagascar (central region)	C	70	73	107	79	77	24
	D	64	64	102	42	67	21
Peru	C	6	6	7	14	9	12
Cajamarca Department	C						3
Lambayeque Department	C				1	2	1
Libertad Department	C		3	2	11	4	1
Lima Department	C	6	2	4	1	4	2
Piura Department	C					1	5

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31,* 1938	Jan. 1–28, 1939	Week ended— February 1939 4	11	18	25	March 1939 4	11	18	25	April 1939 1	8	15	22	29
Algeria: Algiers Department	C	1																
Angola. (See table below.)																		
Arabia: Aden	D							1										
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil. (See table below.)																		
British East Africa: Tanganyika	C	38	46		1	144	1	21	8	57	18	15	6	50	24	15		
Canada:																		
Alberta	C							36	1		2	3	2					
British Columbia	C						4			8								
Manitoba	C			[1]1	8			1				8	14			1	8	4
Ontario	C	1	2	2					1		2							
Saskatchewan	C	[1]2	9	5	17	10							3					
Canary Islands: Las Palmas	C											[1]1						
Ceylon: Maskeliya	C																	

China (see also table below):																		
Amoy	C	-------	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Dairen	C	-------	-------	2	1	-------	-------	-------	-------	-------	1	-------	1	-------	-------	-------	-------	-------
Foochow	C	-------	-------	-------	8	-------	-------	-------	-------	-------	-------	2	-------	-------	-------	-------	-------	-------
Hankow	C	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Hong Kong	C	-------	2	30	18	8	4	7	26	15	11	13	6	12	9	5	4	4
	D	-------	-------	23	13	5	5	5	8	16	11	15	7	6	6	4	5	5
Macao	C	-------	-------	-------	-------	-------	2	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Shanghai	C	53	318	1,264	834	107	64	48	55	29	24	34	15	10	18	10	7	5
Swatow	C	-------	-------	-------	1	2	1	-------	-------	-------	2	-------	-------	3	-------	-------	-------	-------
Tientsin	C	-------	-------	2	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------
Chosen (Korea). (See table below.)																		
Colombia (see also table below): **Cartagena**	D	-------	-------	-------	-------	-------	-------	1	-------	1	-------	1	-------	-------	-------	1	-------	-------
Dahomey. (See table below.)																		
Dutch East Indies: **Surabaya**	C	-------	-------	[2] 1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Ecuador: **Guayaquil** (see also table below)	C	-------	-------	-------	-------	-------	-------	-------	-------	3	-------	1	-------	-------	-------	-------	1	-------
	D	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	1	-------
France. (See table below.)																		
Great Britain: England and Wales—																		
Liverpool	C	-------	-------	1	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
York County	C	-------	3	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Greece. (See table below.)																		
Guatemala. (See table below.)																		
India	C	1,225	1,628	5,335	7,797	2,658	2,644	2,851	3,200	3,076	3,574	3,702	-------	-------	-------	-------	-------	-------
	D	259	401	1,377	1,777	540	644	660	692	744	731	775	-------	-------	-------	-------	-------	-------
Allahabad	C	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	2	-------	-------	-------	-------	-------	-------
Assam	C	33	39	80	67	6	26	21	5	32	31	17	41	46	14	35	47	-------
Bengal Presidency	C	146	160	300	572	377	376	466	516	610	462	534	546	687	642	631	-------	-------
	D	49	29	83	203	140	171	151	170	259	186	183	96	262	203	258	-------	-------
Bombay Presidency	C	361	214	681	1,388	489	362	-------	663	878	876	942	1,240	-------	-------	-------	-------	-------
	D	51	27	91	187	59	65	-------	96	129	104	137	188	-------	-------	-------	-------	-------
Bombay	C	5	-------	2	12	4	3	7	6	6	9	10	28	11	17	20	8	5
	D	-------	-------	1	8	3	2	2	4	5	4	3	9	2	4	6	6	2
Calcutta	C	10	42	116	400	196	194	184	202	221	174	190	221	184	186	205	177	158
	D	7	17	66	231	99	137	103	112	151	120	119	158	141	125	168	129	113
Cawnpore	C	-------	-------	-------	4	1	-------	1	-------	-------	2	1	2	4	1	5	3	1
Central Provinces and Berar	C	14	3	46	81	41	40	39	78	92	126	152	170	245	178	219	281	209
Chittagong	C	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Cochin	C	-------	-------	1	-------	-------	-------	2	2	-------	-------	-------	-------	-------	2	1	-------	-------
Delhi	C	-------	5	23	96	26	15	31	41	39	47	22	25	38	36	34	39	40
Howrah	C	18	5	21	67	32	33	43	40	44	38	51	19	-------	-------	-------	-------	-------
Jodhpur	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	15
Karachi	C	-------	[2] 1	[2] 3	3	1	-------	2	-------	-------	-------	1	[2] 2	1	-------	-------	2	-------
Madras Presidency	C	281	363	893	1,058	345	353	317	374	431	327	328	314	-------	-------	-------	-------	-------
	D	50	55	168	370	39	66	66	62	69	72	43	50	-------	-------	-------	-------	-------
Madras	C	81	160	186	171	60	99	73	72	81	60	43	52	49	39	37	36	32

[1] For 2 weeks.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Jan. 1–28, 1939	Week ended—												
						February 1939				March 1939				April 1939				
						4	11	18	25	4	11	18	25	1	8	15	22	29
India—Continued.																		
Moulmein	C		4		1													
Northwest Frontier Province	C	37	75	290	155	21	16	33	43	23	31	44	16	15	30	28	3	34
Orissa Province	C	46	35	208	338	77	134	119	135	152	148	221	178	192	205	187	237	218
Punjab	C	10	57	135	196	92	65	118	54	55	57	38	30	63	67	25	36	
Rangoon	C	3	5	2	9	1		1	3	7	3	4		5	3			
Sind State	C	29	119	302	158	85	83	39	92	48	97	68	66	58	38	25	48	82
Vizagapatam	C													3	2	1		
India (French):																		
Chandernagor Territory	C			1			2											
Pondichery Territory	C					2	3	1		4		1	2					
	D					1	2	1		2			1					
Indochina (French) (see also table below):																		
Tonkin Province	C	34	95	267	214	35	59	49	40	31	96	50	34	29	59	52	27	6
Haiphong	C					2												
Hanoi	C				1	1	3	2	4	3	1	1	1	1	1		3	8
Saigon-Cholon	C	9		12	6		[3]1	2										
Iran	C	3		1	1						7		4	6				
Iraq	C			1	6				1						5			1
Ivory Coast. (See table below.)																		
Japan:																		
Kanagawa prefecture	C				1													
Kobe	C			3	4	2	38	15	11	4	1	3	8					
Kyoto	C				13		1											
Nagasaki	C			7														
Nagoya	C										1							
Okayama prefecture	C		1	1														
Osaka	C							1		1								
Taiwan.[4]																		
Tokyo	C			2		2	1	1	1									
Malta. (See table below.)																		
Mexico (see also table below):																		
Mexico, D. F.	C			1	1		1	1	1	6				1				
Monterrey	C				4	1		1			1							
Piedras Negras	D												1					
San Luis Potosi	D						2	2	1		1	2				1		
Tampico	C		1			1		2	4	7	9	4	2	1				

Morocco. (See table below.)																		
Nigeria	C	156	87	182	320	212	449	148	175	145	355	121	263	267	224	233	-----	-----
Calabar	C	-----	-----	-----	1	-----	3	-----	3	2	-----	3	-----	1	-----	2	-----	-----
Lagos	C	1	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----
Port Harcourt	C	-----	-----	-----	3	-----	-----	-----	1	-----	-----	-----	1	-----	-----	-----	-----	-----
Niger Territory. (See table below.)																		
Northern Rhodesia	C	9	-----	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Nyasaland	C	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Portugal (see also table below).																		
Lisbon	C	8	20	6	42	2	12	3	4	9	5	4	3	10	7	6	7	-----
Oporto	C	10	-----	5	5	3	3	3	5	1	-----	-----	1	-----	-----	-----	-----	-----
Salvador. (See table below.)																		
Senegal. (See table below.)																		
Siam	C	-----	-----	6	48	-----	[1] 1	-----	[1] 8	-----	1	-----	1	-----	-----	1	-----	-----
Sierra Leone	C	-----	-----	2	4	-----	-----	-----	-----	-----	-----	-----	[1] 2	-----	-----	-----	-----	-----
Southern Rhodesia	C	57	125	30	37	18	6	10	14	-----	-----	-----	-----	-----	9	-----	-----	-----
Straits Settlements: Singapore	C	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----
Sudan (Anglo-Egyptian)	C	30	20	31	28	-----	16	-----	2	4	6	6	1	5	3	8	65	9
Syria: Aleppo	C	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	-----	-----	-----
Turkey. (See table below.)																		
Union of South Africa. (See table below.)																		
Venezuela. (See table below.)																		

[1] For 2 weeks.
[2] Imported.
[3] Information dated Apr. 6, 1939, states that up to Mar. 31, 1939, 61 cases o fsmallpox were reported in Taiwan, Japan.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

On vessels:

S. S. *Hartlebury* bound for New York via Durban [4]	1 case	Dec.	1, 1938
S. S. *Nagasaki Maru* at Nagasaki from Shanghai	1 case	Dec.	7, 1938
S. S. *Pyrrhus* at Yokohama from Shanghai	1 case	Dec.	10, 1938
S. S. *Westpoint* at sea en route Surabaya	1 death	Do.	
S. S. *Tyles* at Yokohama from Hong Kong and Shanghai	1 case	Dec.	13, 1938
S. S. *Nagasaki Maru* at Nagasaki from Shanghai	1 case	Dec.	16, 1938
S. S. *Bellerophon* at Hong Kong from Yokohama, Kobe, and Shanghai	1 case	Dec.	22, 1938
S. S. *Selandia* at Singapore from Saigon	1 case	Jan.	15, 1939
S. S. *Pottsdam* at Singapore from Yokohama	1 case	Jan.	17, 1939

On vessels—Continued.

S. S. *E. Sang* at Swatow from Shanghai	1 case	Jan.	18, 1939
S. S. *Maihar* at Aden from Calcutta	1 case	Jan.	30, 1939
S. S. *Alavi* at Aden from Bombay	1 case	Feb.	2, 1939
S. S. *Orange Moor* at Saigon from Shanghai	1 case	Do.	
S. S. *Queen Victoria* at Victoria from Shanghai	1 death	Feb.	6, 1939
S. S. *Rugelsey* at Williamshead from Shanghai	10 cases	Feb.	19, 1939
Pilgrim ship *Tantalus* at Penang from Jeddah	1 case	Feb.	27, 1939
Pilgrim ship *Ajax* at Penang from Jeddah	1 case	Mar.	2, 1939
S. S. *Gneisenan* at Genoa	1 case	Mar.	5, 1939
S. S. *Riley* at Fremantle from Shanghai	1 case	Do.	

Place		October 1938	November 1938	December 1938	January 1939	February 1939	March 1939
Angola	C		4	27			
Argentina	C					3	
Belgian Congo	C	354	357	211	175	26	
Bolivia:							
Cochabamba Department	C		[5] 4				
La Paz Department	C		[5] 19				
Oruro Department	C		[5] 1				
Potosi Department	C		[5] 15				
Santa Cruz Department	C		[5] 2				
Tarija Department	C		2				
Brazil: **Bahia**	C	5	1	1			
China: Harbin	C				2	1	
Chosen (Korea)	C		1				
Colombia	C	74		[6] 122	25		
Dahomey	C		15	14	12		4
Ecuador: **Guayaquil** and vicinity	C	3	6	2			
France	C				1	3	
Greece	C		3	5	12	1	
Guatemala	C		16			5	
Indochina (French) (see also table above)	C	166	174	475	312	163	515
	D	25	14	65	47	21	79
Ivory Coast	C		25		18		5
Malta	C			9			
Mexico (see also table above):							
Aguascalientes State—Aguascalientes	C	6		6		[7] 15	
Chihuahua State—Chihuahua	C					[7] 1	
Hidalgo State	C	30	7	36		[7] 29	
Jalisco State—Guadalajara	C					[7] 1	
Mexico, D. F.	C		2	6		[7] 7	
Queretaro State	C					[7] 1	
San Luis Potosi State—San Luis Potosi	C		7			[7] 16	
Tamaulipas State—**Tampico**	C					[7] 9	
Morocco	C		3	4	2		1
Niger Territory	C				48	15	7
Portugal (see also table above)	C	72	169	62			
	D	7	12	12			
Salvador	C	1					1
Senegal	C					8	66
Turkey	C				58	8	
Union of South Africa:							
Cape Province	C			1			
Natal	C						
Transvaal	C			37			
Venezuela	D	1		1	2	8	

[4] Patient removed from vessel and died in hospital in Iloilo district, P. I.
[5] For the period Oct. 8 to Nov. 30, 1938.
[6] For November and December 1938.
[7] For January and February 1939.

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Week ended—															
					January 1939				February 1939				March 1939				April 1939			
					7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22
Algeria:																				
Algiers Department	C	6	6	27	1	2	1	5	10	----	2	2	7	5	13	4	6	----	6	----
Algiers	C	----	3	5	----	----	1	1	----	----	----	----	----	5	8	3	----	----	----	----
Constantine Department	C	8	6	44	6	13	28	68	32	20	26	12	36	18	53	57	30	19	38	----
Bone	C	1	1	----	----	----	----	4	----	----	----	----	----	----	2	----	1	----	----	----
Constantine	C	----	1	7	----	----	11	----	7	----	----	1	1	4	2	----	----	4	8	----
Philippeville	C	3	1	3	----	1	1	1	1	----	----	----	----	----	----	14	----	2	----	----
Oran Department	C	5	4	5	16	7	3	2	5	16	4	4	4	10	9	6	2	7	2	----
Southern Territories	C	----	----	----	----	----	----	----	----	----	----	7	2	1	17	1	9	----	1	----
Australia: Brisbane	C	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	----	----
Bolivia. (See table below.)																				
British East Africa: Kenya	C	----	3	3	----	----	----	----	----	----	----	1	----	----	----	----	----	----	1	----
Bulgaria. (See table below.)																				
Chile	C	72	112	147	16	20	21	23	16	17	16	----	----	----	----	----	----	----	----	----
Antofagasta Province	C	5	2	----	----	1	----	1	----	1	----	----	----	----	----	----	----	----	----	----
Concepcion Province	C	2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Curico Province	C	----	----	----	4	3	5	3	----	----	1	----	----	----	----	----	----	----	----	----
Los Angeles	C	----	----	----	[1]9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Nuble Province	C	1	6	3	1	1	----	----	----	1	----	----	----	----	----	----	----	----	----	----
Santiago Province	C	61	70	81	7	10	14	19	11	9	10	----	----	----	----	----	----	----	----	----
Valdivia Province	C	2	1	2	----	1	----	----	1	----	----	----	----	----	----	----	----	----	----	----
Valparaiso	C	4	4	5	----	----	----	----	----	----	1	----	----	----	----	----	----	----	----	----
China (see also table below):																				
Dairen	C	----	1	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Shanghai	C	7	----	----	----	----	5	1	----	----	----	----	----	----	----	----	----	----	----	----
Tientsin	C	----	----	----	----	2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Chosen (Korea). (See table below.)																				
Egypt:																				
Alexandria	C	----	----	2	----	----	----	----	----	----	----	----	1	----	----	2	4	2	1	----
Asyut Province	C	----	----	----	----	----	----	1	2	----	----	2	----	----	----	----	2	----	----	----
Beheira Province	C	----	----	----	----	----	----	1	1	3	12	8	14	14	10	6	22	17	13	----
Cairo	C	----	----	2	----	1	1	1	1	1	13	3	7	14	9	1	6	2	3	12
Dakahliya Province	C	----	----	----	----	----	----	----	----	----	----	11	14	30	16	46	25	20	36	----
Gharbiya Province	C	8	----	----	----	----	----	15	7	23	13	8	82	53	43	67	64	104	97	----

[1] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Week ended— January 1939				February 1939				March 1939				April 1939			
					7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22
Egypt—Continued.																				
Girga Province	C	1						4	7	11	18	22	17	12	5	13	14	12	3	
Giza Province	C								1	10	2	6	8	2	6		8	2	8	
Kalyubiya Province	C								8	3	15	7	25	28	11	20	3	8	3	
Minufiya Province	C							3	14	13	13	27	36	16	18	31	9	6	11	
Minya Province	C	1																		
Qena Province	C															47	61	18	13	
Sharkiya Province	C								3	8	5	1	14	10	17	5	11	25	6	
Provinces	C	32	8	43	2	9	34	25	43	90	98	62	212	155	145	236	229	216	199	234
Eritrea: Hamasien	C														2	2				
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	5	8	7		1			1					1						
Hungary	C			3				1								5		4		
Iran	C		1																	
Iraq	C	1		2							1	1								
Baghdad	C												1							1
Kirkuk Province	C											1								
Latvia. (See table below.)																				
Libya: Suani Benaden	C					3														
Lithuania. (See table below.)																				
Mexico (see also table below):																				
Guadalajara	D			1																
Mexico, D. F.	C	10	10	9		4	1			3	1		1	1						
Monterrey	C	1																		
Nuevo Laredo	D		2																	
San Luis Potosi	D			1														1		
Torreon	D	2		1								1								2
Morocco	C	9	82	117	31	27	34	19	13	43	39	57	35	44	51	47	41	26	42	47
Casablanca	C						1			1	1	4	4	1	1	2	2	2	4	4
Palestine:																				
Haifa	C	3	2	1								1								
Jaffa	C	9		6				3								1			1	
Poland	C	64	94	321	77	62	99	119	121	138	111	93	139	135	171	135	145	165	151	
	D	3	6	20	7	2	3	2	5	6	6	3	5	7	6	5	10	6	5	
Portugal: Oporto (see also table below)	C						2												2	1
Portuguese East Africa: Laurenço Marques	C														2					
Rumania. (See table below.)																				

Straits Settlements: Singapore	C		1					2	2		1	2		1						
Sumatra: Medan	D											1								
Syria:																				
Aleppo	C									1	1									
Beirut	C	1		1												1				
Lebanese Republic	C	1															1			
Trans-Jordan	C	1	1																	7
Tunisia:																				
Tunis	C	19	11	42	8	13	7	15	7	6	12	8	16	14	12	22	32	21	8	
Provinces	C	40	12	261	106	112	84	134	41	182	173	110	109	191	206	188	185	93	221	282
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia	C	14	5	25		5	6	10	13	10	9	6		11	29	9	12			
On vessel: S S. *Stanbrook* at Mersel Kebir	C																			1

Place		October 1938	November 1938	December 1938	January 1939	February 1939	March 1939
Bolivia:							
La Paz Department	C		[1] 14				
La Paz	C		[1] 11				
Oruro Department	C		[1] 3				
Santa Cruz Department	C		[1] 1				
Bulgaria	C		2	2	8		
China: Manchuria—Harbin	C	2	16		5		
Chosen (Korea)	C		21		78		
Greece	C	4	10	8			
Guatemala	C	3	38	2	9	22	25
Latvia	C		1		2		
Lithuania	C		3		30	42	32
Mexico (see also table above):							
Aguascalientes State—Aguascalientes	C	1		2		[1] 11	
Hidalgo State	C	5	1	1		[1] 2	
Mexico State	C	6	7			[1] 8	
Mexico, D. F.	C	10	13	6	2	[1] 14	

Place		October 1938	November 1938	December 1938	January 1939	February 1939	March 1939
Mexico—Continued							
Nayarit State	C		1				
Oaxaca State	C	2	3				
Puebla State—Puebla	C	2	3				
Queretaro State	C	1	2	1		[2] 4	
San Luis Potosi State—San Luis Potosi	C	2	1	5		[2] 8	
Tamaulipas State	C					[2] 1	
Portugal	C		7	3			
Rumania	C	27	77	100	144	121	
Turkey	C	13	21	49	32	46	57
Istanbul	C	2	2	4	6		4
Union of South Africa:							
Cape Province	C		91	53	23	25	
Natal	C		8	1	1	3	
Orange Free State	C		2			1	
Transvaal	C				26		

[1] For the period Oct. 8–Nov. 30, 1938.

[2] For January and February 1939.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 25–Oct. 29, 1938	Oct. 30–Nov. 26, 1938	Nov. 27–Dec. 31, 1938	Week ended—															
					January 1939				February 1939				March 1939				April 1939			
					7	14	21	28	4	11	18	25	4	11	18	25	1	8	15	22
Belgian Congo: Buta	C		[1]1																	
Brazil: [2]																				
Espirito Santo State	D							4	4	6	13	19	5	6	6	4	9	6	2	
Minas Geraes State	D									4	1	3	2		1			1		
Rio de Janeiro State	D					1	1								1					
French Equatorial Africa:																				
Chad—Fort Lamy	C					1														
Sosso	C		1																	
Gold Coast	C	4										[1]1							1	
	D	1																		
Ivory Coast [3]	C	3	[4]8	[5]5						1		2						[1]2		1
	D			2						1										
Nigeria	C	1	4	3		2			[1]2							1				
	D					1			2											
Port Harcourt	C		1																	
Sudan (French):																				
Kona	C		[1]1																	
Sangha	C			1																
Tougan	C	3																		
On vessel: S. S. *St. Octave* at Grand Bassam Roadstead from Bordeaux, Dakar, Konakry, Tabou, and Sassandra	C		[1]1																	

[1] Suspected.
[2] See also reports of yellow fever in Brazil in preceding issues of the PUBLIC HEALTH REPORTS.
[3] For the week ended May 6, 1939, 3 suspected cases of yellow fever were reported in Ivory Coast.
[4] Includes 1 suspected case.
[5] Includes 2 suspected cases.

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